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The Nature of Louping-ill.*

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The name "Louping-Ill" has been loosely applied to what is now recognised to be a group of diseased conditions which, while representing different distinct pathological entities, are manifested by similar syndromes.

Stockman, among others, recognised that louping-ill was frequently confused with a septic meningo-myelitis, and with the epileptiform convulsions in lambs which are commonly associated with the presence of a foreign body ("wool ball") in the abomasum.

From information obtained in the field, there would now appear to be little doubt that another condition commonly confused with louping-ill is that known as lambing sickness, which recently has been shown to represent an acute hypocalcæmia[1]. This disease commonly occurs in parturient ewes in the early part of the louping-ill season.

It has long been generally recognised, however, that a specific disease, characterised by nervous symptoms of obscure origin and possessing a definite seasonal incidence, principally in spring and early summer, existed within certain areas in the Border counties and West of Scotland.

The land upon which the disease is encountered consists principally of rough hill grazings, a type of ground in which the British tick (*Ixodes ricinus*) finds its optimal conditions, and since it has been found that ticks are invariably present on louping-ill pastures, and because the seasonal periodicity of the disease closely correlates with the period in which ticks exhibit their maximal seasonal activity, it has been presumed that *Ixodes* is concerned in the transmission of louping-ill.

Stockman[2,3] described certain intracellular bodies which were present in smears of lymph glands and spleen, and similar bodies which also occurred within the leucocytes in blood collected from cases of louping-ill.

He appears to have attached considerable importance to the presence of these so-called "chromatin bodies," but left the question of their possible causal relationship to the disease an open one. Stockman was able to transmit repeatedly a febrile affection by serial inoculations with blood and with the juice of lymph glands obtained from affected animals, and on several occasions produced an experimental disease which resembled louping-ill. A febrile affection was also elicited by infesting susceptible sheep with presumably infective ticks, but his claim that the result of these latter experiments represented the experimental transmission of louping-ill should, we believe, be accepted with reserve.

In 1929, the Animal Diseases Research Association undertook a systematic investigation of louping-ill under the direction of Mr. W. A. Pool. The report of that season's work, which has already received publication[4], records the successful regular transmission of the disease to susceptible sheep and pigs by the intracerebral inoculation of material prepared from the brain and spinal cord of affected sheep.

It was also found that the infective agent was usually, but not constantly, present in the mesenteric lymph glands and spleen; it was usually present in the blood at some stage of infection, but was not demonstrated in cerebro-spinal fluid, aqueous humor, bone marrow, liver or skin.

Infection was also produced by intra-spinal, intra-sciatic, intra-ocular, intravenous and subcutaneous inoculation, and by ocular instillation, but was not produced by intra-muscular, intradermic and endermic inoculations, intra-nasal instillation or by administration *per os*.

It is possible that Stockman in his earlier inoculation experiments succeeded on several occasions in transmitting the disease experimentally, but it would appear that he did not regard the Central Nervous System as the principal focus of the infecting agent[2]. The results of the 1929 work at the Moredun Institute demonstrated that the infecting agent was in fact present in the Central Nervous System and that by the adoption of the intracerebral route, the transmission of the disease by the inoculation of tissue derived from the Central Nervous System could be regularly effected.

In the spring of 1930, upon Mr. Pool's relinquishing his part in the investigation, the work was resumed under the direction of the senior writer.

HISTO-PATHOLOGY OF LOUPING-ILL.

From a study of the histological lesions in the Central Nervous System which obtain in sheep affected with louping-ill, two of us (A. B. and D. R. W.) have shown that the pathology of the disease is represented in a meningo-encephalo-myelitis. This finding has proved of great value in the work to be described as, by its means, we have been enabled to verify the production of the disease in our experimental test animals.

This part of the investigation forms the subject of a separate paper.

In Spring, 1930, the motor field laboratory was situated on the farm of Gilmanscleuch in the Ettrick Valley, and from it were forwarded to the Institute the brains of five sheep suspected of having died from louping-ill. Four of these cases had been seen before death and samples of the blood of these were also submitted for calcium analysis.

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The cases may be tabulated as follows :—

Table I.

Case No.	Description of Animal.	Mgs. Ca. % Serum.	Histo-Pathology of Brain.
1.	Hogg	8·60	Encephalo-myelitis
2.	Lactating parturient ewe	6·53	Normal
3.	Lactating ewe ...	9·40	Normal
4.	Lactating ewe ...	9·00	Normal
5.	Hogg	—	Encephalo-myelitis

The normal concentration of blood calcium in the sheep has a relatively wide range. In an examination of 37 normal cases, the value was found to vary from 7·33 mgs. per cent. to 11·92 mgs. per cent., with an average value of 9·50 mgs. per cent.

Blood calcium determinations have been made in five sheep experimentally infected with louping-ill, and in these it was found that the values (average 10·90 mgs. per cent.) were within the normal range.

In case 2 (Table 1) a distinct hypo-calcæmia existed, and from this it may be inferred that the animal was probably affected with lambing sickness and not with louping-ill.

In only two cases (Nos. 1 and 5) lesions of encephalo-myelitis were present, and by comparison with Table 2 it will be observed that these were the only cases in which it was subsequently found that an infective agent could be demonstrated in the Central Nervous System.

Experimental Transmission of Louping-ill.

It was resolved to repeat the transmission experiments of 1929, and the following technique was employed :

The affected sheep was destroyed by bleeding, and portions of cerebrum, cerebellum and spinal cord from the cervical, thoracic and lumbar regions were removed under strictly aseptic conditions and forwarded in sterile containers to the Moredun Institute. The material was then ground up with sterile sand, and normal saline was added to produce approximately a 10 per cent. suspension. This was transferred to sterile test tubes, and allowed to sediment. The supernatant fluid, after submission to sterility tests, was used for the intracerebral and other inoculations.

The intracerebral inoculation was performed as follows :—

After surgical preparation of the area of operation, an incision 1 cm. in length was made about 4 cm. behind the horn and about 2 cm. lateral to the median line. With a sharp-pointed, narrow-bladed scalpel the bone was perforated to a depth sufficient to permit of the insertion of a small bore hypodermic needle (0·5 mm. diameter). One c.c. of the suspension was then inoculated into the substance of the cerebrum. The operation was performed under general anæsthesia.

The results of the primary attempts at transmission may be tabulated as follows :—

Table 2.

Case.	Test Animals.	Inoculum.	Method of Inoculation.	Result.
1	A	Brain and cord emulsion	Intracerebral	T.R. : T.L.I.
	B	Brain and cord emulsion	Intracerebral	Negative
	C	Cerebro-spinal fluid.	Intracerebral	Died*
	D	Brain and cord emulsion	Subcutaneous	T.R. only
2	A	Brain and cord emulsion	Intracerebral	Negative
	B	Brain and cord emulsion	Intracerebral	Negative
	C	Cerebro-spinal fluid.	Intracerebral	Negative
	D	Brain and cord emulsion	Subcutaneous	Negative
3	A	Brain and cord emulsion	Intracerebral	Negative
	B	Brain and cord emulsion	Intracerebral	Negative
	C	Brain and cord emulsion	Subcutaneous	Negative
4	A	Brain and cord emulsion	Intracerebral	Negative
	B	Brain and cord emulsion	Intracerebral	Negative
	C	Brain and cord emulsion	Subcutaneous	Negative
5	A	Brain and cord emulsion	Intracerebral	T.R. : T.L.I.
	B	Brain and cord emulsion	Intracerebral	T.R. : T.L.I.
	C	Brain and cord emulsion	Subcutaneous	Negative

* Death occurred three days after inoculation from causes unconnected with louping-ill.
T.R. = Thermal reaction. T.L.I. = Typical Louping-Ill.

Interpretation of "Thermal Reaction" in Sheep.

The normal temperature of the sheep varies within a remarkably wide range, but the limited normal range has been determined arbitrarily as from 103° F. to 105° F.

A thermal reaction was considered to have occurred when the rise in temperature was gradual, sustained and reached a point above 106° F.

It was found that the intracerebral inoculation of infective material was usually followed by a period varying from two to three days in which the temperature was normal; thereafter a thermal reaction occurred which reached its acme about the fourth to fifth day, after which there was a rapid defervescence, and in those cases in which the thermal reaction was followed by symptoms referable to nervous disturbance, these appeared on or about the fifth or sixth day.

Approximately 12 per cent. of cases inoculated intracerebrally with infective material proved refractory in so far that the thermal reaction was not followed by appreciable clinical disturbance.

Filtrability of Infective Agent.

Since all attempts to demonstrate the presence of visible micro-organisms in the infective material had failed; and since, if we except the "chromatin bodies" described by Stockman, no organisms resembling protozoan parasites had been found in the blood, it was an evident possibility

that the infective agent would be found to represent a filtrable virus. This view was further supported by the histo-pathological findings, the nature of the lesions in the meningo-encephalo-myelitis being suggestive of those caused by a neurotropic virus.

Attempts to effect the filtration of the infective agent had been made during 1929, but these had proved indefinite.

Portions of two brains obtained from sheep experimentally infected with louping-ill were forwarded to Professor T. J. Mackie, of the Department of Bacteriology, Edinburgh University, who kindly supplied us with Berkefeld filtrates prepared from this material. We tested the infectivity of these filtrates as follows :—

In the first experiment a concentrated and a dilute filtrate were used.

One c.c. of concentrated filtrate was inoculated intracerebrally into each of two normal sheep (Nos. 903, 910) and 1 c.c. of dilute filtrate was similarly inoculated into one normal sheep (No. 900).

One of the two sheep which received concentrated filtrate (No. 903) developed a typical thermal reaction followed by symptoms of louping-ill, death occurring on the eighth day. The other two sheep remained completely normal.

One c.c. of filtered brain emulsion, obtained from the above positive case (No. 903) was injected intracerebrally into three sheep (Nos. 927, 928, 929); all developed typical symptoms of louping-ill.

From a positive inoculate of the ninth passage (*vide infra*) (No. 898) 1 c.c. of a concentrated filtrate of infective brain was injected intracerebrally into three sheep (Nos. 925, 926, 930). All three developed typical louping-ill.

From two of the above positives (Nos. 925, 926) 1 c.c. of brain filtrate was inoculated intracerebrally into four sheep (Nos. 932, 937, 938, 941). All developed typical louping-ill.

In our own preparations of filtrate a test organism was always included, the emulsion being filtered to check the efficiency of the candle. The test organism used was a broth suspension of *B. prodigiosus* from 24 hour agar slopes, standardised so that the final emulsion to be filtered contained approximately 100,000,000 bacteria per c.c. As far as possible we endeavoured to have the filtrates representing one part of brain to nine parts of diluting fluid.

To obtain this concentration 1 gm. of brain was pounded in a mortar, and to this was added 4·0 c.c. of broth pH 7·4) and 5·0 c.c. of double the standard *prodigiosus* emulsion in broth pH 7·4, giving a final brain suspension of one in ten and approximately 100,000,000 bacteria per c.c.

This suspension was allowed to sediment for about three hours at room temperature and the supernatant fluid used for filtration.

The usual points in filtration experiments were noted, *viz.*, the duration of filtration, the pressure employed, the temperature at which filtration was carried out and the reaction of the emulsion and subsequent filtrate.

Agar slopes were inoculated with the emulsion before filtration and with the filtrate.

The candles used were Berkefeld V, N and W and Chamberland L_1, L_1 *bis*, L_2, L_3 and L_5. *B. prodigiosus* regularly passed the Berkefeld V and Chamberland L_1 candles. On some occasions it passed the L_1 *bis*. but was never found in the Berkefeld N and W, or Chamberland L_2, L_3 and L_5 filtrates.

Animal tests of the filtrates were carried out in sheep and mice by intracerebral inoculation. Sheep were given 1·0 c.c. and mice 0·1 c.c. of the test filtrate.

Filtrates shown to be free of the test organism by prolonged sterility tests were capable of setting up typical louping-ill in both sheep and mice; the mouse, as will be discussed later, having been found to be a susceptible animal.

The detailed animal experiments are not included in this paper, but bacterial free filtrates from Berkefeld N and W, and Chamberland L_2 and L_3 candles have produced the typical experimental disease in 46 mice and 12 sheep.

The Chamberland L_5 candle has given a negative filtrate on all occasions.

Inference.—From these observations it was concluded that the infective agent is a filtrable virus.

Attempts to Infect Laboratory Animals with Louping-ill.

To carry out a closer laboratory study of the infective agent and, if possible, to find some reliable means of establishing a diagnosis in naturally occurring cases of louping-ill it was desirable to obtain a susceptible animal less expensive than the sheep.

The work of Pool, Brownlee and Wilson[4] in this connection was of an inconclusive nature, and it was resolved to subject laboratory animals to extended trial in the hope that a highly susceptible small animal might be discovered. Rabbits, guinea-pigs, rats and mice were used for this work.

Prior to the completion of these experiments infective sheep brain was forwarded to Professor T. J. Mackie of the Bacteriology Department, University of Edinburgh, for filtration, and Dr. J. M. Alston and Dr. H. J. Gibson of that Department informed us that, using this material, they had set up a disease in mice similar to louping-ill of sheep by intracerebral inoculation with brain emulsified in saline and also with Berkefeld filtrates. They also found that the infective agent could be passaged in series from mouse to mouse.

Mice.

We have now successfully passaged the virus through five generations in mice and have infected several hundred mice in the course of other experiments, and the evidence indicates that the mouse is a reliable animal for use in the detection of the presence of virus in a given sheep tissue.

The possibility that mice could become experimentally infected with a virus distinct from that of louping-ill and latent in the Central Nervous System of sheep cannot be disregarded, but against this view there is the following evidence :—

(1) We have been able to transmit an infection—the symptoms of which in the sheep are indistinguishable from those of louping-ill—from sheep to mouse and from mouse to sheep with facility.

(2) We have so far failed to transmit the infection by injecting mice with non-infective sheep brain emulsion.

(3) The histological lesions in the brain of affected mice are similar to those present in louping-ill in sheep.

The technique used for carrying out intracerebral inoculation of mice is similar to that described by Max Theiler[5] in his studies of the action of yellow fever virus in mice.

The hair over the posterior part of the skull is clipped and a depilatory agent applied. After removal of the hair, the site of inoculation is prepared with an iodine dressing, and the operation is performed under a general anæsthetic (A.C.E. mixture). Injections are made through the skin and bone in the posterior parietal region at a point slightly lateral to the median line. We have found a 1·0 c.c. tuberculin syringe fitted with a needle 0·4 mm. in diameter most suitable for this purpose. 0·1 c.c. can be conveniently inoculated intracerebrally, and if the tissue emulsion employed be not heavier than 1 in 100 of normal saline, few deaths as a result of operation should occur, probably not more than 4 per cent. With emulsions heavier than 1 in 100 greater care is necessary, but 0·1 c.c. of 1 in 10 can be injected successfully if the emulsion be allowed to settle and the supernatant fluid used. The day following injection, if the operation has been successful, the mice appear quite bright and they remain thus until the onset of symptoms.

The incubation period is usually five to nine days, depending on the strength of emulsion employed, but it has been as long as 23 days with low concentrations of infective material. Prior to the onset of symptoms hyperæsthesia accompanied by marked reflex excitability is frequently observed, and the coat of the little animal, once sleek and clean, becomes rough and dishevelled, and symptoms of paralysis in one or more limbs usually develop later, the fore paws and legs being commonly first involved. Death may take place very shortly after the appearance of the premonitory symptoms, and usually occurs within 24 hours after the onset of disease.

Attempts have been made to infect mice by the intravenous and subcutaneous routes in a limited number of cases.

Three mice, which were inoculated subcutaneously with 0·5 c.c. of a 1 in 10 emulsion of infective brain in normal saline, remained healthy over a period of 21 days' observation.

At the same time, six mice were given a similar dose subcutaneously. Twenty-four hours after the first inoculation 0·1 c.c. of saline was injected intracerebrally. Two of the six developed typical experimental louping-ill in eight and twelve days, the disease being subsequently confirmed by passage in two mice from each case which developed typical symptoms and died in seven days.

Five mice were done by the intravenous route, and although one died on the 19th day, we are not convinced that death in this case was due to louping-ill.

Since it is the main object of our investigation to devise a suitable method of preventing the disease in the field we considered it advisable to adopt some standard material for infection experiments, so that we should have a test product of which we knew the infecting dose.

The brain of an experimentally infected sheep was removed with sterile precautions and pulped in a covered sterile mortar without sand. The pulp thus produced was spread out in thin layers in sterile Petri plates and dried in *vacuo* over H_2SO_4 and caustic soda in a desiccator. This was stored in the cold (0° C.-4° C.). The brain material was removed at intervals and broken up with sterile instruments. In a fortnight a comparatively dry powder was obtained and stored in sterile Lambeth tubes in a desiccator over P_2O_5.

Subsequent work with the powder has shown that it is regularly infective for mice and sheep. It has been accurately titrated on many occasions and has remained stable over a period of three months. An example of such a titration in mice is shown in the following table:—

Table 3.

Powdered Brain Emulsified in Normal Saline. Mice Inoculated Intracerebrally.

Two mice 0·1 c.c. of 1 in 10 normal saline	++ T.L.I., 5 days.
Two mice 0·1 c.c. of 1 in 100 normal saline	++ T.L.I., 7-8 days.
Two mice 0·1 c.c. of 1 in 1,000 normal saline	++ T.L.I., 8-13 days.
Two mice 0·1 c.c. of 1 in 10,000 normal saline	v+ T.L.I., 13 days.
Two mice 0·1 of 1 in 100,000 normal saline	vv, observed for 24 days.
Two mice 0·1 of 1 in 1,000,000 normal saline	vv, observed for 24 days.

T.L.I. = Typical Louping-ill.
+ = died.
v = lived.

Titrations of this description involving the use of many mice have proved to us that 0·1 c.c. of 1 in 1,000 of this powdered brain is generally infective for mice. Occasionally deaths take place at 1 in 10,000, but in no case has a mouse receiving a lower dilution developed louping-ill.

The foregoing observations lead us to believe that the disease is not highly contagious in mice, as in these experiments all the mice included in each titration experiment were housed together, and were thus in intimate contact.

In another experiment three healthy mice were placed in the same box with four inoculated mice. The four inoculated mice developed typical louping-ill in six and eight days. The remaining healthy mice were kept under observation for 22 days and no symptoms developed. These mice were then inoculated with 0·1 c.c. of infective brain emulsion and all developed typical louping-ill in six days.

Rabbits.

Rabbits of various ages have been inoculated intracerebrally without positive result. In one experiment 12 rabbits were used; 0·3 c.c. of a 1 in 10 suspension of infective brain failed to cause any symptoms over a period of 60 days.

Guinea-Pigs.

Twelve guinea-pigs received the same dose as the rabbits, and these failed to develop any symptoms over a similar period of observation.

Rats.

Ten rats of varying size and age, but mainly adults, were inoculated intracerebrally with 0·3 c.c. of a 1 in 10 saline suspension of infective sheep brain. On the 25th day after infection one of these animals showed weakness

and lack of co-ordination of movement of the limbs. It was able to progress only slowly when urged to move, and had a hunched-up appearance and staring coat. This animal was etherised and the brain was removed and emulsified in normal saline to give a concentration of 1 in 10.

Two mice received 0·1 c.c. of the emulsion intracerebrally.
Three rats ,, 0·3 c.c. ,, ,, ,,
One sheep ,, 1·0 c.c. ,, ,, ,,

The mice did not develop symptoms over a period of 21 days' observation.

The three rats did not develop any symptom over a period of three months, when close observation was discontinued.

The sheep developed a typical temperature reaction which reached its height on the sixth day, and thereafter it rapidly fell to 98·4° F. on the ninth day. On the eighth day the sheep showed louping-ill symptoms, tremors of the head, dulness and occasional staggering. On the morning of the ninth day the animal was unable to rise and lay on its side kicking occasionally with the hind legs; thereafter coma rapidly developed, when the sheep was then destroyed. The usual aerobic and anaerobic sterility tests of the brain yielded no growth after seven days' incubation. A portion of the brain of this sheep was emulsified to make a 1 in 10 suspension in normal saline and inoculated thus:—

Two mice were given 0·1 c.c. intracerebrally.

Two rats were given 0·3 c.c. intracerebrally.

One sheep was given 1·0 c.c. intracerebrally.

The two mice showed typical symptoms in six days.

The two rats did not develop symptoms.

The sheep developed typical louping-ill in six days and was destroyed. Aerobic and anaerobic cultures from the brain were negative after six days' incubation.

Two mice were inoculated with 0·1 c.c. of a 1 in 50 saline suspension of brain from this sheep. Both developed typical louping-ill in seven days.

These transmissions may be tabulated thus:—

Table 4.

Saline Emulsion of Brain, 1 in 10, prepared from Sheep L.S.B. 7 on October 23rd, 1930.

October 23rd, 1930. — 10 rats inoculated I.C., Nos. 1204-13.

November 17th, 1930. — Rat No. 1204 showed symptoms suggestive of louping-ill on 25th day. Killed. | Rats Nos. 1205-1213, remained healthy.

November 17th, 1930. — Sheep No. 11. Typical louping-ill on ninth day. Killed. | Three rats, Nos. 1427-29, remained healthy. | Two mice, Nos. 1425-26 remained healthy.

November 26th, 1930. — Sheep No. 16. Typical louping-ill on sixth day. Killed. | Two rats, Nos. 1455-56, remained healthy. | Two mice, Nos. 1458-9. Typical louping-ill with paralysis on sixth day. Destroyed.

December 2nd, 1930. — Two mice, Nos. 102-3. Typical louping-ill on seventh day. Destroyed.

Serial Passage of Virus in Sheep.

Summary of Experiments.

The virus from Case No. 1 was passaged serially through 23 generations.

That from Case No. 5 was passaged serially through five generations; the serial passages were then concluded.

Sixty-three normal sheep were inoculated intracerebrally with infective brain emulsion. Of these, 55 were successfully infected with typical louping-ill; the remaining eight showed a thermal reaction but remained otherwise unaffected.

Non-infectivity of Normal Brain Emulsion.

(Control Experiments.)

Six normal sheep (Nos. 586, 782, 813, 814, 837, 923) were inoculated intracerebrally with brain emulsion obtained from a healthy sheep.

Of these four (Nos. 586, 782, 837, 923) showed an atypical rise in temperature which occurred at the seventh to tenth day and continued for from four to six days, but no symptoms of louping-ill developed; one of these sheep (No. 586) developed a febrile condition on the tenth day after inoculation and died four days later from lobular pneumonia; the other two sheep (Nos. 813 and 814) remained completely normal.

Intracerebral Inoculation with Blood Serum Collected during Febrile Stage of Disease.

In order to determine whether the infective agent was present in the blood during the febrile phase, four sheep (Nos. 545, 743, 817, 821) were inoculated intracerebrally with blood serum obtained from a typical case (No. 903) during the febrile acme. Of these, three developed louping-ill; in the remaining one (No. 545) no reaction was elicited.

Inference.—From the above experiments it was concluded that the disease could be regularly transmitted by intracerebral inoculation with material obtained from the Central Nervous System of affected sheep, and could also be passaged with blood serum collected at the height of the febrile stage of the disease. These results thus confirmed those obtained by similar experiments in transmission in 1929.

Transmission of Louping-Ill to the Pig.

Two pigs (Nos. 912 and 913) received intracerebral injection of virus from sheep No. 845. Typical symptoms of louping-ill developed in each case on the fifth and sixth day respectively.

These findings may be regarded as further confirmation of the 1929 work on the experimental transmission of the disease to pigs.

Attempts to Induce Infection by Methods other than Intracerebral Inoculation.

Inoculation by Lumbar Puncture.

In one sheep (No. 772) inoculated sub-durally by lumbar

puncture with infective brain emulsion, typical symptoms of louping-ill were induced.

Ocular Instillation of Virus.

A small quantity (0·5 c.c.) of infective brain emulsion was instilled into the eye of each of two sheep (Nos. 951, 954). The results were negative.

Intra-Ocular Inoculation.

Two sheep (Nos. 959, 960) each received 0·25 c.c. of infective brain emulsion as an intra-ocular injection. One of these (No. 960) died two days after the operation from acute chloroform pneumonia. The other remained normal.

Phenomena following Subcutaneous Inoculation of Virus.

It was found that the subcutaneous injection of virus was frequently followed by a rise in temperature without the subsequent development of nervous symptoms.

In 1929, two of us (A.B. and D.R.W.) had found that sheep, which had developed a thermal reaction only after subcutaneous inoculation with infective material, subsequently resisted an intracerebral inoculation with infective material.

Since we had shown that the blood at the height of fever was infective, it appeared reasonable to assume that the rise in temperature following the subcutaneous injection of the virus might represent a true infection which in turn might give rise to the production of an active immunity; this assumption was further supported by the fact that the thermal reaction following the subcutaneous inoculation was similar in its character to that preceding the symptoms of louping-ill in sheep inoculated intracerebrally.

Three sheep (Nos. 891, 892, 896) had been inoculated subcutaneously at the first, second and fifth passages of the infective agent from Case No. 1 and one sheep (No. 899) had been inoculated subcutaneously with No. 5 strain. In all these experiments no symptoms of louping-ill had been elicited other than a thermal reaction which was present in the first three cases.

An intracerebral injection of infective brain emulsion was given to these four animals, and also to two " clean " (control) sheep (No. 770, 781). As an additional control, a sheep (No. 897) which had proved completely negative when inoculated intracerebrally with cerebro-spinal fluid from the negative case No. 2 was also included.

Result.—The three control sheep died from typical louping-ill, one on the seventh day, and two on the eighth day. The four sheep previously injected subcutaneously remained completely normal.

Inference.—Subcutaneous injection of infective brain material results in a thermal reaction followed by immunity.

Intradermal Inoculation of Virus.

As has been already indicated, the possibility that the disease under natural conditions was transmitted through the medium of the tick was a very evident one. In order to imitate inoculation by tick bite, 0·5 c.c. of filtered infective brain emulsion was injected intradermally into two sheep (Nos. 953, 958). Both of these test animals responded by exhibiting a typical thermal reaction, and one of them (No. 958) on the ninth day after inoculation showed symptoms of locomotor disturbance similar to those of louping-ill, followed eventually by recovery.

Intra-Nasal Insufflation.

A suspension of crude brain emulsion (in amounts of 10 c.c.) was sprayed into the nostrils of seven sheep (Nos. 942, 944, 946, 964, 965, 966, 967) by means of a nebuliser. Each showed a typical thermal reaction but no further symptoms developed, except in the case of one sheep (No. 964) in which nervous symptoms suggestive of those of louping-ill were noted. In this case slight tremor of the head accompanied by considerable hyperæsthesia developed on the ninth day. On the following day these symptoms were succeeded by dulness which continued for 24 hours, when recovery appeared complete.

Five c.c. of an emulsion of infective brain filtrate was similarly sprayed into the nasal passages of two sheep (Nos. 939, 940).

In two other sheep (Nos. 962, 963) the nasal passages were scarified previous to spraying with crude brain emulsion.

In each case a thermal reaction, but no further symptom, was elicited.

Production of Active Immunity.

It was necessary to regard the results of intradermal injection and intra-nasal insufflation as indefinite. By neither method were the typical symptoms of louping-ill produced. It was to be remembered that under natural conditions the disease gives rise to readily appreciable symptoms in only a proportion of a flock, and it was conceivable that one might fail to produce typical symptoms by infective doses of virus if the number of test animals was limited.

On the other hand, since we had shown that a subcutaneous injection of virus could produce an active immunity, it seemed reasonable to postulate that the hypothetical infection which had been set up by the intradermal and intra-nasal routes could be determined, as in the case of subcutaneous injection, by subjecting each of the inoculated sheep to an intracerebral injection of virus, and then observing whether a degree of immunity had been obtained from the previous inoculation.

Accordingly, the 11 sheep which had received an intranasal insufflation with virus together with the two sheep which were inoculated intradermally, and six (Nos. 905, 906, 907, 911, 955, 957) which had received a subcutaneous injection, were gathered. Two clean (control) sheep (Nos. 975, 977) were mixed with these and all 21 animals were then inoculated intracerebrally with infective brain suspension.

The results are tabulated on next page.

Specificity of Immunity to the Virus.

We assumed that the immunity induced was specific to the virus and did not merely represent an immunity to the inoculation of cerebral tissue. The correctness of this assumption appears to be proved by the following experiments :—

Two sheep (Nos. 894 and 895) which had remained completely normal when previously inoculated intracerebrally with brain emulsion prepared from the non-infective cases Nos. 2 and 3 respectively, and one sheep (No. 898) which had remained completely normal when previously inoculated subcutaneously with material from the non-infective case No. 4, were now inoculated intracerebrally with infective brain suspension obtained at the eighth passage of the virus.

Table 5.

Sheep No.	Primary Inoculation. Nature of Primary Method of Inoculation.	Temperature Reaction following Primary Inoculation.	Interval between Inoculations (in days).	Secondary Inoculation (Intracerebral). Temperature Reaction.	Other Clinical Symptoms.
942	Simple Nasal Insufflation	+	26	+ Mild	None
965	,, ,, ,, ...	+	19	+ Mild	,,
*939	,, ,, ,, ...	+	33	+ Mild	,,
*940	,, ,, ,, ...	+	33	+ Mild	,,
944	,, ,, ,, ...	+	26	—	,,
946	,, ,, ,, ...	+	26	—	,,
964	,, ,, ,, ...	+	19	—	,,
966	,, ,, ,, ...	+	19	—	,,
967	,, ,, ,, ...	+ (Mild nervous disturbance)	19	—	,,
962	Nasal Insufflation after Scarification	+	19	—	,,
963	,, ,, ,,	+	19	—	,,
*953	Intradermal inoculation	+	26	—	,,
*958	,, ,, ...	+	26	—	,,
905	Subcutaneous inoculation	+	19	—	,,
906	,, ,, ...	+	19	—	,,
907	,, ,, ...	+	19	—	,,
911	,, ,, ...	+	19	—	,,
955	,, ,, ...	+	19	—	,,
957	,, ,, ...	+	19	—	,,
975	No previous inoculation (Control) ...	0	—	+	Typical louping-ill. Death occurred in both cases.
977	,, ,, ,, ...	0	—	+	

* Filtered brain emulsion.

It will be observed that intracerebral inoculation produced louping-ill only in those sheep which had not previously received infection. From these results it was concluded that an active immunity to the disease may be established experimentally by nasal insufflation, and by intradermal inoculation as well as by subcutaneous inoculation.

In each case a thermal reaction followed by typical symptoms of louping-ill developed.

As a control to these experiments, four normal sheep (Nos. 809, 829, 902, 904) were inoculated subcutaneously with infective brain emulsion: two (Nos. 902, 904) showed thermal reaction only; the other two remained unaffected. After an interval of 43 days these four sheep were inoculated intracerebrally with infective virus and all four remained completely unaffected.

The results may be tabulated as follows:—

Table 6.

Sheep No.	Nature of Primary Inoculation. Inoculum.	Method Employed	Result. Temperature Reaction	Result. Nervous Disturbance	Nature of Secondary Inoculation. Inoculum.	Method Employed	Result. Temperature Reaction	Result. Nervous Disturbance
894 ...	Non-infective Brain and Cord Emulsion Case No. (2)	Intracerebral	— ...	None	Infective Brain Emulsion (8th passage)	Intracerebral	+ ...	Louping-ill
895 ...	,, ,, ,, (3) ...	,,	— ...	None	...	,,	+ ...	,,
898 ...	,, ,, ,, (4) ...	Subcutaneous	— ...	None	...	,,	+ ...	,,
904 ...	Infective Brain Emulsion (8th passage) ...	,,	+ ...	None	...	,,	— ...	None
902 ...	,, ,, ,, ...	,,	+ ...	None	...	,,	— ...	,,
829 ...	,, ,, ,, ...	,,	— ...	None	...	,,	— ...	,,
809 ...	,, ,, ,, ...	,,	— ...	None	...	,,	— ...	,,

Duration of Immunity.

In order to determine whether the active immunity produced by the subcutaneous injection of the virus was of prolonged duration, two sheep (Nos. 874, 885) which had received a subcutaneous injection of virus on December 5th, 1929, were inoculated intracerebrally on October 10th, 1930, an interval of 322 days. In each case the result of the intracerebral injection was completely negative.

Four other sheep (Nos. 854, 858, 860, 865) received a subcutaneous injection on October 31st, 1929, and this was followed by an intracerebral inoculation on November 20th, 1929, with completely negative result.

These four sheep were again inoculated intracerebrally with virus on October 23rd, 1930, *i.e.*, 337 days after the previous intracerebral inoculation, again with completely negative result.

It is interesting to note that the virus with which the sheep were inoculated intracerebrally on October 23rd, 1930, was a different strain from that used in the previous (1929) experiments.

Inference:

It is concluded that an active immunity of long duration can be experimentally produced against a severe (intracerebral) infection.

Tick Experiments.

As has been mentioned, there is strong circumstantial evidence that the tick, *Ixodes ricinus*, plays an important rôle in the transmission of the disease. The disease under natural conditions is encountered in its full manifestation in only a proportion of the sheep stock on infected land. It follows that the negative results which had been obtained by previous investigators in their attempts to transmit the disease by tick infestation might be explained on the ground that, since only a limited number of test sheep were used, these may have proved refractory to infection because they possessed a considerable degree of natural immunity.

In view of our findings that an active immunity could be produced by injecting the virus intradermally, it was hoped to determine whether infection by tick bite could actually be elicited by first infesting clean sheep with ticks collected from louping-ill land and later testing for the presence of immunity in these sheep by subsequently injecting the virus intracerebrally.

The following experiments were carried out mainly under the supervision of Mr. J. McLeod, B.Sc., Entomologist at the Institute.

Two clean sheep (Nos. 901, 908) were infested with numerous nymphs and larval ticks gathered from infected pasture during the height of the louping-ill season. Neither of these sheep developed louping-ill, but on the fourth day after infestation both showed thermal reactions.

From one of these sheep (No. 908) 9 c.c. of blood were drawn during the febrile fastigium and inoculated subcutaneously into a clean sheep (No. 780), which we shall call "Sheep A"; no symptoms of louping-ill were produced in this sheep other than a thermal reaction which again developed on the fourth day.

From this sheep ("Sheep A") 10 c.c. blood were taken at the febrile fastigium and inoculated subcutaneously into another clean sheep (No. 893)—"Sheep B." Again a thermal reaction was obtained at the fourth day, but no other symptoms of louping-ill developed.

In order to determine whether any immunity had been developed, "Sheep A" was then inoculated intracerebrally with virus—16 days after the subcutaneous inoculation, and eight days after the temperature had returned to normal—this resulted in the development of a typical thermal reaction followed by the typical symptoms of louping-ill.

"Sheep B" was inoculated intracerebrally with virus eleven days after the subcutaneous inoculation and six days after the temperature had returned to normal. A thermal reaction followed by symptoms of louping-ill also developed in this case.

The original tick-infested sheep (Nos. 901, 908) were also injected intracerebrally with virus ten days after each had returned to normal. Both developed typical louping-ill.

From one of the original tick-infested sheep (No. 908) blood was also taken nine days after the temperature had returned to normal, and inoculated subcutaneously into a clean sheep (No. 924)—"Sheep C"—this resulted in the production of a thermal reaction only.

From this sheep—"Sheep C"—blood taken at the fastigium of the febrile phase was inoculated intracerebrally into two clean sheep; in one of these (No. 934)—"Sheep D"—a thermal reaction developed; the other (No. 935) remained completely normal.

Forty and 34 days after their primary subcutaneous inoculation, "Sheep C" and "D," respectively, were then inoculated intracerebrally with virus. Both developed typical louping-ill.

From another tick-infested sheep (No. 909), which developed a thermal reaction but no other symptoms of louping-ill, 1 c.c. blood serum taken at the fastigium was inoculated intracerebrally into a clean sheep—"Sheep E"—a thermal reaction, but no other symptoms of louping-ill followed.

Thirty-three days later "Sheep E" received an intracerebral injection of virus and developed typical symptoms of louping-ill.

As a control to the above inoculation experiments, two sheep (Nos. 10 and 12) were respectively inoculated subcutaneously with blood from two healthy sheep (Nos. 22, 915). In each case no thermal reaction was shown, the sheep remaining completely normal.

As a control to the infestation experiments with ticks collected from infected pastures, two sheep (Nos. 983, 999) were massively infested with "clean" larval ticks, *i.e.*, larvæ bred from females which had engorged on healthy sheep. Both animals remained completely normal.

From these experiments it would appear that infestation with ticks collected from infected pastures during the louping-ill season produces a febrile condition which can be transmitted by subcutaneous inoculation of blood drawn either during, or subsequent to, the febrile attack; but it would seem that the febrile condition obtained by the tick infestation or subsequent inoculation either does not represent a true louping-ill infection, or that the hypothetical infection so produced was insufficient to protect against the intracerebral injection of virus.

Discussion.

It is the purpose of this paper to give a broad survey of the present position of the investigation of louping-ill which has been undertaken by the Animal Diseases Research Association.

With this purpose in view detailed records of experiments are given only where the need for lucidity of description warrants their inclusion.

It is therefore intended that this report shall be supplemented by a number of specialised papers relating to the various aspects of the louping-ill problem upon which the writers are severally engaged.

The cause and the essential pathology of louping-ill have now been determined and, while the investigation has so far failed to incriminate the tick as a causal factor in the disease, the available evidence does not negative this possibility.

Heavy tick infestation such as occurs in the louping-ill areas has a marked debilitating effect upon the sheep, which frequently become rapidly reduced in condition and weight during the height of the infestation. It is therefore possible that tick infestation may itself predispose the animals to attack.

The possibility that infection with one virus may awaken into activity a different and latent virus infection has received considerable attention during recent years, and it is conceivable that the "tick fever" which has been shown to follow experimental infestation may activate a latent

louping-ill virus infection of which many sheep may be carriers.

It is intended to test such speculative views during the course of the investigation.

Although, as has been indicated, the means by which infection occurs under natural conditions are still unknown, it is of interest to note that experimental evidence suggests that the disease may be contracted by the nasal inhalation of virus.

It has been found that sheep can be immunised against the intracerebral injection of virus, a procedure which constitutes a very severe test of immunity, but it yet remains to devise a safe and effective means of protection against the natural disease, and research to this end is in active progress.

Since the disease under discussion bears some resemblance to poliomyelitis in man, the hope is expressed that these studies may yet prove of some value to comparative medicine.

Summary.

1.—Clinical and other evidence suggests that parturient hypocalcæmia is to be recognised as among the several diseased conditions confused with louping-ill in the field.

2.—The histo-pathology of louping-ill is represented by a meningo-encephalo-myelitis suggestive of that caused by a neurotropic virus. The evidence upon which this conclusion is based is the subject of a separate publication.

3. –The causal factor of louping-ill has been found to be a filtrable virus.

4.—The disease can be produced in the mouse, and with much less certainty in the rat, by intracerebral inoculation, and can be retransmitted from these animals to the sheep.

5.—The rabbit and guinea-pig were found to be refractory to infection.

6.—The results of the 1929 experiments in the transmission of louping-ill have been confirmed in that it has been possible to effect the regular transmission of the disease in sheep by the intracerebral inoculation of material prepared from the brain and spinal cord. The blood of affected sheep was also found to be infective.

7.—The experimental transmission of louping-ill to the pig was confirmed.

8.—It was again found that infection could also be produced by intra-spinal and subcutaneous inoculation, but failure to infect by ocular instillation and intra-ocular injection in a limited number of test animals is recorded.

9.—Sheep which withstood intra-nasal insufflation, intradermal and subcutaneous inoculation of infective material were protected against subsequent intracerebral inoculation of virus. Means whereby sheep may be protected against the natural disease are thus indicated.

10.—The immunity induced in experimental sheep has been found to possess a duration of at least eleven months.

11.—It was found that a febrile reaction can be experimentally induced in sheep by infesting them with ticks collected from infected pastures, and also by the serial inoculation of sheep with blood obtained from these tick-infested sheep; but the reaction obtained did not protect against the subsequent intracerebral inoculation of louping-ill virus.

Acknowledgments.

We desire to record our sense of gratitude to those from whom help has been received.

To Mr. Andrew Linton, B.Sc., Gilmanscleuch, and to Mr. T. M. Macdonald, Barguillean, we are especially indebted for the full facilities in field investigation, and other material aid, which, at all times, have been so freely given.

Professor T. J. Mackie, Department of Bacteriology, Edinburgh University, kindly prepared the filtrates used for our early filtration experiments, and first informed us of the susceptibility of mice.

Thanks are also due to the Research Committee of the Association for their helpful criticism and encouragement.

We also desire to record our appreciation of the zealous assistance which has been rendered by the staff of this Institute.

Some Problems of the Veterinarian.*

By R. A. Willett, M.R.C.V.S.

It is with some diffidence that I rise this evening to present this short paper to you. I feel that it is an honour for such a young member to be invited to do so, and the limitations of my experience have forced me to write more from a veterinary political standpoint than from a scientific one.

When one leaves college after graduation, full of enthusiasm and theoretical knowledge, one very soon experiences a number of shocks. To begin with, it was instilled into me that some form of insurance was essential to the practitioner; when, therefore, the company which I approached with regard to an accident policy sent me a form which bore on it "Class C—extra—bartenders, licensed horse slaughterers, veterinary surgeons and the like," you can imagine I received a shock. In my opinion, this is a most unfortunate classification; the general public, who handle these proposal forms daily, immediately get a bad and quite erroneous impression of our profession as a whole. To judge by the attitude of a large number of people, the only man who knows little or nothing about animals in health and disease is the veterinary surgeon. Sooner or later one is called in to attend an animal for a member of the agricultural community who takes a great interest in one or more of the numerous periodicals which are available. In one such case an owner asked me my opinion, and after much thought and care I arrived at a diagnosis. Immediately the farmer jumped on me and said: "Well, that is not what So-and-So said in the paper I take in." This farmer wrote to the Veterinary Correspondent giving *some* of the symptoms of the case and then expected to get a correct diagnosis. One cannot blame the adviser, but it seems very wrong that the man on the spot, who has the chance of asking detailed questions and making a careful examination, should be considered mistaken. This is not an isolated case, but has occurred several times, and not only to myself. In these days "quackery" flourishes and, as far as I can see, this sort of correspondence course of treatment of animals savours very strongly of it. It is, at any rate, a very serious thing in some cases for the wretched animals who have to submit to it.

We have also amongst us other people whose aims are supposed to be the alleviation of suffering of the sick animals. A well-known society had a long illustrated article in a recent periodical. In my opinion, some of its

* Paper presented to the Central Division, N.V.M.A., at 10 Red Lion Square, W.C.1, on March 5th, 1931.

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statements are open to criticism. Let me quote one paragraph: "Because he would be ruined without its services, and cannot afford a veterinary surgeon's fees, such a man is often economically compelled to work a horse or a donkey when it is not thoroughly fit." Where is the veterinary surgeon who does not do something in the cause of humanity and in alleviation of pain in animals? Personally, I am sure we all do it constantly. Furthermore, there are ways in which these people can obtain the advice and help of a qualified practitioner which is (so it appears in the article) more than they are doing in this case. No mention is made of who performs the wonderful operations which are described, or what their qualifications are. I think that it is in the interests of the public and also of our profession that this should be made clear.

I expect many of you noticed that recently a Member of Parliament asked a question in the House regarding the number of vivisection experiments which had been carried out at the Royal Veterinary College in the past year. It seems to me that if this gentleman had only made a few inquiries he would have very soon found out that that institution is so starved of funds that it can scarcely keep its doors open, let alone go in for experiments. Unfortunately, the word "vivisection" is grossly misinterpreted and in a large number of cases is used without the slightest knowledge of its true meaning. In my opinion, the Anti-Vivisection Society flourishes because many of the people who leave it money do not realise the supervision and care taken before a licence is granted to a suitable person and also because they have no knowledge and no wish to learn of the tremendous studies made by scientists with the judicious use of experiments in the living animal. This inference, by a minority, which must undoubtedly harm and hinder scientific discovery, is unwarranted and unreasonable. How many of the people who believe in the objects of this work have ever heard of the free clinic of the Royal Veterinary College? Although many of us may not altogether agree with it, there is no doubt that it has done marvellous work and at the same time assisted the student to see some practice which would not otherwise have come his way. But now that the R.C.V.S. has made a move to insist on its students seeing practice outside during the vacations, part of the function of the clinic will be not quite so necessary.

I expect many of you will remember that last year, at one or more of the meetings here, the question of whether there was any need for men who would and could specialise was discussed at some length. One point was not brought forward then, and that is that there is a great need for specialists among the staffs of the veterinary colleges throughout Great Britain. Who can name a veterinary physiologist at the present time? I fully realise that a great part of this loss and omission is due to the unfortunate financial position in which these colleges find themselves, but I do feel that those are the places where the clinician who is in a quandary should be able to look for advice and help from an acknowledged expert in some special science rather than an expert general practitioner.

Another point in connection with these colleges which I consider quite feasible. Many of those of us who are general practitioners have cases which we, for some reason or other, find ourselves quite unable to undertake —cases of extreme interest; cases where there is the greatest need for that delicacy, expert surgery and after-care which is possible at the colleges which I personally have seen; if there were some system whereby these cases could be sent to, the colleges then much benefit would accrue to the patient, the student, and to the profession as a whole, whereas at present, although many may dispute the point, patients are operated upon and treatment carried out under inimical conditions.

Reading the daily press from a layman's point of view, I recently came across a long column concerning some outbreak of a mysterious disease amongst the larger animals in the North of England. No mention was made of any treatment being carried out by veterinary surgeons, but great prominence was given to the investigations of the experts of the Ministry of Agriculture; the word veterinary was conspicuous by its absence. Is this quite fair? We are a comparatively young profession and are forbidden to advertise and yet when an opportunity arises to inform the world that there are such people as veterinary experts (and I sincerely hope that veterinary surgeons were engaged in this investigation), not a word is said. And now there is more trouble to face; the Ministry of Agriculture, in their wisdom, have seen fit to appoint veterinary advisory officers. These men are recruited from the younger and less experienced members of our profession and, as far as one can see, their duties are to gain the confidence of the agricultural community and entirely oust the general practitioner. I have purposely used strong language, because this procedure is, in my opinion, a totally unnecessary and rather despicable action by a Government Department, and can only lead to discredit and trouble for some members of our profession. How Gilbertian is the situation of the practitioner who indirectly pays the salary of the man who is to deprive him of his living, and drive him out of his practice. I am sure we all wish the Governing Body every success in their efforts to find a solution to this problem and thus avoid an inevitable disaster.

In connection with the more scientific side, I have several things to bring before you which to my mind have been extremely difficult. In connection with the Tuberculosis Order:—A valuable cow had been suffering from a cough for some time. This animal had been tested by me and had given a positive reaction, but was kept in order that she might calve and wean the calf—in passing may I add, against my advice. The animal then had a temperature of 104·5° F. and showed every sign of pneumonia, although on inquiry I learnt that since she calved she had steadily lost weight. On percussion the lungs appeared practically solid and the general symptoms were that of a waster. I advised the owner to report her and this was done. Next day I was informed that the animal could not be taken under the order and that she was suffering from pneumonia. On my advice the animal was slaughtered and *post-mortem* revealed widespread tuberculosis in an active state. The point which I wish to stress is this: Is the Tuberculosis Order really making an attempt gradually to stamp out tuberculosis or is it not? Here was an animal which, in the local practitioner's view, was one which should be dealt with immediately under the Order, and instead of removal it was allowed to spread infection. The animal was rapidly getting worse

and obviously the veterinary surgeon would not advise the owner to report her unless he felt sure of his diagnosis. The owner's question is this: "What is the good of these Acts and Orders if they are only carried out when all the damage is done? A man who is trying to help by reporting as soon as possible is penalised and only when the animal has done its worst is anything done."

Whilst on the subject of orders, I should like to say how much I deprecate the attitude of our medical confrères on the question of graded milk. Many of them do not seem to have the slightest idea of the difference between one grade and another; in fact, it is my certain knowledge that some think that Grade A is the highest. One grants a certain amount of lack of interest on the part of the general public, but when it comes to the medical adviser being as ignorant as that on a point of inestimable importance, I think it high time something was done to improve the state of affairs. I believe that about 18 months ago, after much discussion, some agreement was reached as to a new arrangement of the classification of milk, but that is as far as things seem to have gone. Gradually people are getting wrong ideas on the subject and nothing is done in the way of publicity to put the man in the street on the right track. Many times during the past 18 months it has been my job to explain the various designations to people and then they are amazed that they have never been told before. Here, to my mind, is one of the great difficulties of our profession in that, except in a comparatively few cases, the medical profession make little attempt at co-operation.

I feel that I have occupied sufficient of your time, but may I say a few words in conclusion and thus finish on a brighter note. Few of us realise how much we owe to the Central and kindred divisions of the N.V.M.A. It is my opinion that, but for the meetings of practitioners, such as we have here, the Council of the N.V.M.A. would have an infinitely greater task in the elucidation of the problems which come before them. There is always an atmosphere of friendliness and good fellowship, which is one of our greatest assets. It is a thousand pities that so many of our colleagues see fit to abstain from joining these societies; nevertheless, I fear that is their loss and not ours. (Applause.)

Discussion.

The President (Captain G. Dunlop Martin) observed that they had listened to a most interesting paper from Mr. Willett. He had raised many points which he hoped would be fruitful in producing a thoroughly good discussion.

Mr. J. M. Armfield enquired if the essayist could state who would stop him from slaughtering a tuberculous animal, receiving the reply "the veterinary surgeon to the local authority."

The President said that raised in his mind the question, where there was an absolute difference of opinion in a case of that sort, was there no provision for an appeal to an arbitrator?

A Fellow: "No, Sir."

Mr. R. A. Willett remarked that, with regard to that question that had been raised, he personally had no animus whatsoever against the veterinary surgeon to the local authority: in his opinion, it was the Order which was at fault. He himself was not the veterinary inspector to a local authority; at the same time, it seemed to him that if an animal was in such poor condition that all the owner would get for it was 45s., then "don't take" appeared to be the advice that was given.

Mr. H. E. Bywater said that he would like to make a few remarks on Mr. Willett's case. He did not think that it was the Tuberculosis Order in itself that was to blame in any way, but the individual who had to work it. As veterinary surgeons they should be bold in the administration of the Order. He had taken many such cases as that described by Mr. Willett and had valued them fairly highly, but he had never been stopped by the Ministry of Agriculture. He always attempted, however, to obtain a specimen of sputum, urine, dung, or milk, and to try and demonstrate the presence therein of acid-fast bacilli. When he found these, he did not stop to question which particular type of acid-fast organism it was—it was tuberculosis for him: if one could demonstrate an acid-fast bacillus in conjunction with clinical symptoms one was justified in taking an animal under the Order. He had examined thousands of cows under the Public Health (Meat) Regulations during the past four or five years, and it was interesting to note that during that period a percentage of not less than 60·5 of cows examined in the slaughterhouse exhibited some tuberculous lesions—of course they were not generalised cases. He was surprised at the percentage of cases of tuberculosis of the udder one got without the animal being an advanced case of tuberculosis, and he had had a number of cases of animals taken under the Tuberculosis Order, and which had been valued at 75 per cent., which had proved to be udder cases.

Mr. J. H. Poles said that he would like to ask Mr. Bywater what was done with the carcasses in the case of highly-valued animals that he took under the Order, because if fit for human food they should be used; but, as a County Council official, he could assure them that in a country district they could not get a butcher to take them.

Mr. Bywater replied that his Council had laid it down that any animal taken under the Tuberculosis Order must not be used for human consumption, and the carcasses were sold for the manufacture of manures, etc. There were many cases dealt with by him under the Tuberculosis Order which, if they were dealt with under the Public Health Meat Regulations, would be passed as fit for human consumption.

The President said that, arising out of the question of the somewhat hazy idea of medical men as to their powers and duties in regard to graded milks and so on, he would like to relate an experience he had some few years ago. He was asked to go to a certain farm, on behalf of the R.S.P.C.A., to see some beasts and calves that were said to be starving. He found the condition of the whole farm to be deplorable. The owner had from eight to ten cows, and he was sitting in an ancient barn, milking one of them, when the speaker went in. The farmer was using a very dirty pail, into which the milk was being strained through an equally filthy cloth. The cow, in common with the others, was in a disgustingly dirty state and covered with manure, and the man was in a condition to match: in fact, he (the President) could not help telling him that he wanted boiling first. (Laughter.) Within eight feet of him, where he sat milking the cows, and in the middle of the shed, was a great heap of manure; the liquid draining therefrom ran down through the shed in a gully, the outlet from which was blocked by straw and manure.

He interrogated the man as to when the Medical Officer of Health for the district had last been along, the answer being that the farmer had been at the place for 24 years and the Medical Officer had not been there yet. That incident occurred, not in the "bad old days," but within the last four years. The man was convicted of cruelty, and after giving evidence he (the President) asked permission of the Chairman of the Bench to make a few remarks. He told them of the total absence of inspection at that man's farm, and he represented to the Bench that that was a terrible omission on the part of the Medical Officer of Health for the district and that, in his opinion, a report on the state of affairs prevailing in that connection should be forwarded to the proper quarter; in fact,

he begged that that should be done, but what happened he did not know.

Mr. Bywater, who was familiar with the case cited by the President, added that the farmer in question was struck off from the list of milk sellers.

Professor Wooldridge enquired what steps had been taken in regard to the Medical Officer of Health.

Receiving, from Mr. Bywater, the reply that the official in question was a part-time man, Professor Wooldridge commented that that was immaterial: the part-time man should do his duty as well as the whole-time man, or clear out.

Proceeding, Professor Wooldridge observed that he would like to know from Mr. Bywater, in regard to those cases in which the latter had said that the whole carcass was condemned and destroyed, where, had they been dealt with under the Public Health Meat Regulations, they would have been passed for human consumption, what compensation was given to the owners of those cattle?

Mr. Bywater replied that these were cattle valued on the higher (75 per cent.) scale for compensation purposes.

Professor Wooldridge apologised to the essayist for dealing with points raised in discussion. He desired, at the outset of his remarks concerning the paper, to compliment Mr. Willett on his maiden effort in regard to bringing forward papers for discussion. (Hear, hear.) They had had from Mr. Willett on former occasions some interesting cases and *post-mortem* specimens and they had been quite aware that the time would come when he would give them something even more substantial to discuss.

He was reminded in the earlier part of Mr. Willett's paper, when the essayist referred to the agricultural press and the answers to correspondents, of a letter he received only that morning from a farmer in the provinces who had a mare with bad canker. She had been under treatment by the local veterinary surgeon for three months and he said he could do no more for her, whereupon the farmer had enquired of him (Professor Wooldridge) what he could do to help him and saying it was a disgrace that the veterinary surgeon should have run up a big bill for nothing. They could rest assured that he let the farmer know what he thought of him for expecting veterinary surgeons to "blackleg" one another. (Hear, hear.)

In the earlier part of his paper Mr. Willett had made some reference to the Colleges. He was not quite certain what the essayist's views were in regard to the matter of the cheap practice carried on at the Royal Veterinary College, but the latter did say that there were varied opinions in regard to it. He (Professor Wooldridge) was sure that was so and that many veterinary surgeons in practice in comparative proximity to Camden Town had from time to time felt that the College practice—particularly the cheaper practice—was doing them an injury. He would like to assure them (and Dr. McCunn and Professor Wright would agree) that that was not the case, and that every possible care was taken that the people who availed themselves of it were fit and proper persons to receive such assistance. He could say at once that one was not always successful in spotting the right people: they must remember that people who were intending to be fraudulent in that matter were as knowing as it was possible to be. But every effort was made to safeguard the interest of the practitioner in the area or district from which any particular case might come. That was an assurance which could and should be accepted without hesitation. There were instances where they were imposed upon, but could anyone tell him of any case in which gratuitous help was given where imposition was impossible?

The next point to which he would like to refer was that concerning Veterinary Advisory Officers and the rather severe criticism Mr. Willett made in regard to them and the effect of their activities on the work of the practitioner. He must admit that he had had the same fear at one time, but since the conditions of appointment of those men had been laid down the position was much clearer, and if the men who were appointed strictly adhered to the conditions and terms of their appointment, then he thought there would be little or no difficulty. They were not there to gain the confidence of farmers, to take the work out of the hands of the veterinary practitioners of the district. They were not allowed to undertake any treatment, or to give advice as to treatment: their duties were laid down, in that they were told in their instructions that they must take the veterinary surgeon of the district always into consultation before any such advice was given. Under such circumstances he thought the Veterinary Advisory Officer should be able to increase the amount of work of the practitioner in the district. A lot would depend upon the personality of the individual who was appointed, and that was the great objection to the appointment of young, inexperienced men who, however well they might know their veterinary work, had no experience of men and matters. If the Veterinary Advisory Officer were to take on such a duty as outlined by Mr. Willett, he would immediately come under the ban of the Registration Committee, under the heading of touting or supersession.

He felt, therefore, that if practitioners would only meet the Veterinary Advisory Officers when they were appointed, and map out the line of conduct which was most destined to help both the farmer and the veterinary surgeon, nothing but good could result; but if the veterinary practitioner rode the high horse and tried to ostracise the Veterinary Advisory Officer, he was only asking for trouble himself. It was a question of mutual assistance.

The references to graded milk made by Mr. Willett were very cogent. Only the other day a medical man brought his dog to him and he (Professor Wooldridge) was of opinion that the animal had got abdominal tuberculosis. They discussed the manner in which the dog could have become infected, and the speaker mentioned milk. The doctor replied that the dog could not have derived infection from that source, as, although it certainly took a considerable amount of milk, it was "Grade A." Many medical men were ignorant of the milk designations and still more of their significance, and they and the general public would continue to be misled while such an absurd designation as "Grade A" was given to the third-grade article. But before they stigmatised the medical men, was it quite certain that all members of the veterinary profession—even all in that room—had familiarised themselves with the designations and their definitions? When they did know them, let them make a point of talking to their medical confrères about them, advertising the fact that veterinarians disapproved of the nomenclature and that they had tried to get it bettered. He thought that before long that nomenclature would be altered in such a way as to do away with that confusion.

He again complimented Mr. Willett on bringing those matters forward for general discussion.

Professor J. G. Wright observed that since he was in charge of what Professor Wooldridge had described as the cheap practice at the Royal Veterinary College, but which they called the Poor Out-patients' Clinic, he desired to say that, to his mind, Mr. Willett's remarks on that subject were not nebulous; indeed, they were highly satisfactory. He told them that the Poor Out-patients' Department was of great value in giving students clinical experience, and he thanked him for those remarks. He did not think that Mr. Willett intended to question that clinic at all, but, as the matter had been raised, there was one point he would like to stress, and that was that a practitioner in London, having a case which necessitated operative treatment for which the owner could not afford to pay an adequate fee to the veterinary surgeon, or where, not having the time to carry it out, he sent the case to the Poor Out-patients' Department of the Royal Veterinary College, should send a letter up with it, so that they could perform what was necessary and send the case back to him. When a practitioner sent a case up to that Department they were under an obligation to see it, but they did not know the financial circumstances of the owner, and they would much rather do what was necessary and send the case back to the practitioner for after-treatment.

Another point concerning which it was necessary for him to complain was this: for some simple little operation on an animal, practitioners referred the poorer type of

client to them. He (Professor Wright) wanted the practitioner to appreciate that, in so doing, he was lessening his practice and making potential practice for them which they were not anxious to have: they had nearly 10,000 cases a year and they did not want any more.

Mr. Willett's paper was in one respect unique, in that he had touched upon a host of subjects and had broken a lot of new ground. His remarks urged him, particularly on the subject of "quackery," to put forward a view of his own, and that was that he considered that the veterinary profession, either through the medium of the N.V.M.A. or whatever body was the correct one, should start a campaign to educate the public. They heard a lot about that, but nothing was done. The British public had not the slightest idea as to the nature of the conditions from which animals suffer and therefore could not appreciate the work of the practitioner. It had not the remotest idea as to what was meant by contagion or what was contagious from animal to man—that was why it resorted to "quackery," and why cure-all preparations abounded. He would like to urge there that experts in the various subjects be asked to write articles, to be distributed by the correct body, in an endeavour to instruct animal owners in the nature of disease. They would not be treading upon any professional corns; they would merely be telling the public the nature of disease, in order that they might at once call in a veterinary surgeon instead of flying to "quack" remedies. This would apply to all their animals, not only to the small.

They knew there had been a little trouble where a practitioner had been appointed, usually by the Ministry, to lecture to farmers, and that practitioners condemned that service as a means of decreasing their practice in a district: if this were done by a committee under no particular person's name, he thought that only good could come to the practitioner as a result of that propaganda.

Captain W. J. LEYSHON, having expressed his appreciation of Mr. Willett's paper—an appreciation which, he was sure, was shared by everyone present—said that, with regard to the essayists' remarks as to anti-vivisection propaganda, the foolishness of the so-called anti-vivisectionists would be obvious to everyone in the room, but the word "vivisection" was obviously a misnomer. As far as he understood it there was very little vivisection in connection with animal experimentation, and that the practice of vivisection was restricted largely to physiologists.

With regard to Grade A milk, he could only agree with Professor Wooldridge as to the unfairness of putting "Grade A" on a cart from which milk was sold on the road, thereby inducing purchasers to think that they were getting the best milk obtainable. They believed that, because it was "Grade A." He was of opinion that all the silly, complicated designations should be abolished and that milk should be known for what it was—either "good" or "bad." A point that appeared to him to show how unfair it was to call third-class milk "Grade A," was that the persons buying that milk, believing it to be the best, were thereby purchasing milk which could contain tubercle bacilli.

Major F. J. TAYLOR observed that he endorsed the remarks that had been so wisely expressed by Professor Wooldridge. In reference to Advisory Officers being properly appointed by the Ministry of Agriculture, who had now revised the duties to meet suggestions of the N.V.M.A., he thought there was now a main object in view in creating these officers—and a good object—which was principally to explain to the farmers the Acts and Orders of the Ministry, how they must be carried out, the general treatment of stock, to maintain health and show the best profit. He thought they would serve a very useful purpose if these objects were discreetly pointed out with tact and patience. He was a country practitioner, and an inspector under county and city authorities, and he found that farmers did not understand properly Orders in regard to many diseases, and that they would appreciate someone in authority explaining these to them: that should be the chief work of the Veterinary Advisory Officer. If the Ministry of Agriculture, with that discretion which they always looked to them with confidence to exercise in these matters, would only sanction the appointment of experienced men who had a thoroughly practical knowledge, and the necessary gift of tact, he certainly thought that these appointments would be in no sense detrimental to the interests of the veterinary practitioner, but would provide an infinite assistance in regard to a better understanding between the Ministry, the farmer and the profession.

In regard to the so-called free clinic of the R.V.C., he had always received the greatest courtesy and help from the College staff in the instances where clients had sent up, on the cheap, for special advice, etc. If they were clients who could afford it he advised them to become subscribers, and was of opinion that this special branch of help to practitioners could be usefully developed. He was surprised to hear Mr. Willett's case of the tuberculous cow reported under the Tuberculosis Order of 1925 which, from the latter's observation, was undoubtedly an advanced clinical case, and that his (Mr. Willett's) opinion was not supported by the inspector for the local authority. If he (Major Taylor) had a case of tuberculosis reported through a practitioner he looked upon it as already diagnosed, out of courtesy to that practitioner and confidence in his diagnosis being relied upon, and he had never been let down up to now. (Hear, hear.) It was up to the inspector always to support the general practitioner who reported the case on the basis that "If we don't support each other, the public will not support us." He did a great deal of work in carrying out the Tuberculosis Order of 1925 and he was astonished at the number of cases reported as emaciated animals which on *post-mortem* had Johne's disease and tuberculosis. He looked upon the former disease as a greater menace at present to the dairyman than tuberculosis. He always made a practice of valuing an emaciated animal as highly as he possibly could, to encourage the dairyman-farmer to report more often, and he thought if that practice were generally adopted by inspectors they would get a greater number of chronic cases out of herds, but where a dairyman thought he was only going to get the "advanced" price for the carcass—which was 45s.—it paid him to conceal even an old cow so long as she could wean calves, and they would never get rid of these unreported cases until a proper system of periodic inspection was introduced.

At the present time a very small percentage of counties were making use of their powers under the Milk and Dairies Act, and he failed to see how the Tuberculosis Order, or any other order, could be enforced unless a strict system of veterinary inspection was instituted.

He was interested to hear Mr. Willett's remark in regard to students during vacation, and that the College "insisted" upon their seeing practice. He was not aware that the College had the legal authority to insist upon the manner in which a student should spend his vacation, and judging by the undergraduates in Oxford, they certainly seemed to please themselves in spending their vacations after their own hearts. It was evident, therefore, that even university authorities could not control them in this respect.

Mr. J. W. H. HOLMES remarked that that was an historic day in the history of the Royal Veterinary College—that afternoon they had had a great carnival and that evening they had had a lot of criticism levelled at them. (Laughter.)

In regard to the question of specialisation, Mr. Willett's was a view that had often been put forward, due probably to the enthusiasm of youth, but he did think that they might carry out a little more research work in connection with clinical work, *i.e.*, veterinary applied research.

Most of the money spent on research at the present time was spent on what we might term pure research carried out in laboratories, and he expressed the view that at relatively low cost, and with great advantage a small staff of suitably trained persons might be introduced into the Colleges for the purpose of carrying out observations and research on the cases actually in the infirmaries.

Professor J. MCCUNN said that he rose because there had been some question raised about the clinic—whether

it was free or otherwise—at the College. That clinic could be of great benefit to the practitioner if co-operation were practised. He would like to put on record that they must have the co-operation of the practitioner: they never knowingly took a client away from a practitioner. In their cross-examination of these clients, very often they found that they had been to a veterinary surgeon and had come to the college because, in many instances, they were very anxious. His hearers had only to put themselves in the position of these people—they thought the world of their dog or their horse, or the animal might be of great economic value to them. Let each one of them imagine, if his own child were ill, and he had lost just a little faith in his practitioner—he would take that child to the first person in whom he could hope to have confidence. That confidence might not always be justified, but they got quite a number of that type of case coming to the College, and their practice there was to give the owners confidence again, to get them to go back to the practitioner—they used every endeavour to that end. But they must have the co-operation of the practitioner so that, if the College had succeeded in reviving the confidence of the owner in the practitioner, the latter would receive him or her back. They were continually having cases—they had one only the previous Thursday—where men came up in that state of mind. In that particular case he examined the dog and did not let the man off without a fee; in fact, they charged him a guinea, and they reassured him in his confidence in his veterinary practitioner. In his presence, he rang up the practitioner and arranged for the animal to go back to that practitioner. Next morning he was dumbfounded, because the owner came to the College with a letter from that practitioner saying that he refused to have anything further to do with the case. That was by no means an isolated case, as Professors Wright and Wooldridge and Mr. Holmes could testify. Practitioners should not feel slighted if a man temporarily lost confidence in them; it was bound to happen sometimes, and it was the College's duty, if possible, to restore that confidence and, having restored it, he thought the practitioner should not feel hurt; he should place himself a little in his client's position, recognise that man's necessity, forgive him for his action and take him back again—then everyone would be happy.

Mr. H. E. Bywater observed that Professor Wooldridge had enquired what had been done with the Medical Officer of Health concerned in the case recounted by the President, whereupon he (the speaker) had said that the Medical Officer of Health was a part-time man. The Medical Officer of Health was not responsible, however, for the "donkey work"; his job was that of administration, and the work of inspection of cowsheds and dairies was carried out by the sanitary inspector, who was the man to blame. Obviously, however, the real culprits were the local authorities, many of whom employed one inspector, over 100 square miles, for all kinds of duties connected with the health of the human population. So vast was the area and so varied were those duties that it was quite impossible for them adequately to be performed, and it was because of the laxity of the local authorities that those inspections of cowsheds and dairies were not carried out in the way that was intended.

Professor Wooldridge replied that the sanitary inspector, nevertheless, was under the direction of the Medical Officer of Health.

In connection with Veterinary Advisors, much of the work that would be done by them had been carried out up to now, to a great extent, by the Agricultural Advisors, some of whom had been very severe thorns in the side of the veterinary profession, and if it were going to oust them in this connection, the appointment of Veterinary Advisors would be a very useful step. It was only recently that an Agricultural Advisor had been guilty of saying that the veterinary surgeon was the greatest enemy of the farmer, but the "National" did not sit down under that, and secured a recantation. (Hear, hear.)

Miss K. Shedlock said that, at the beginning of his paper, Mr. Willett had mentioned the subject of insurance, and she was wondering if, in any of his dealings with insurance companies, he had had as great a shock as she did. She applied for a policy against accident, but received a reply that such a policy could not be issued to a female veterinary surgeon. She had been trying for 18 months, and had at last found an insurance company which thought it might accept the risk at something like double the usual premium.

The President stressed the importance of the points regarding the necessity for propaganda which had been raised. He did not know whether many of them noticed the article at the time, but two or three years ago the *Daily Mail* middle page contained an article on "Cats and Diphtheria," with reference to an outbreak of that disease in New York in which the medical profession were at a loss to account for its origin. All the cats in the neighbourhood were killed and the outbreak ceased, and the *Mail* put that forward as a case of cause and effect. Evidently they were quite under the impression that cats suffered from diphtheria and were the cause of diphtheria in humans.

He wrote to the *Daily Mail* about it, pointing out that no one had yet succeeded in infecting the cat with human diphtheria and saying that, although cats might carry diphtheria in the same way as the human might carry it, they did not suffer from it and could not be infected. He asked them to give his letter the same degree of publicity as they accorded to the article. However, he had no reply from the *Daily Mail* and his letter was not published.

Professor Wooldridge commented that the N.V.M.A. had taken up the matter of propaganda a year or two ago, when they paid a well-known man with some entré to the Press a pretty high fee to endeavour to secure the publication of articles and other matter on behalf of the veterinary profession, but his efforts, although they were successful up to a certain point, were not considered sufficiently successful to warrant his retention. Efforts at propaganda had, therefore, been made in recent times; moreover, the N.V.M.A. had not ceased their efforts to secure publicity, for the Press agencies were kept supplied with material, while they were always on the look-out to correct Press misrepresentation, but there was no sure way of getting space in the Press unless they were prepared to pay highly for it, and then material sent was put in under the heading of advertisements.

The Reply.

Mr. R. A. Willett, in reply, first thanked the Fellows for the kind reception they had accorded his paper. Professor Wooldridge (he proceeded) had spoken on his remarks relative to cheap practice at the Royal Veterinary College. When he (Mr. Willett) had mentioned that, he was not trying to cast any slur upon that practice, and it was both enlightening and good to hear of the care which was taken to find out the class of person who was bringing an animal for treatment.

While speaking on that subject, he desired to refer to Professor McCunn's observations concerning the co-operation of the practitioner. It was to the promotion of that co-operation that his (the speaker's) remarks were directed: what he would like was a greater degree of co-operation between the College and the practitioner. Some short while ago his firm had a case which it was quite impossible for them to take over, and some slight hitch arose as to the people to whom the animal belonged becoming subscribers to the College. On making enquiries it was found that the veterinary surgeon could not be an ordinary subscriber to the College. He thought that in cases with which the veterinary surgeon was quite unable to cope—not only surgical, but many other sorts of cases—they might be sent to the College and, after the necessary treatment had been carried out there, returned to the practitioner, the College to look to the practitioner for payment, through his client.

[Professor Wooldridge: "That is done."] He did not think, then, that it was sufficiently known.

[Professor Wooldridge: "I should like to say that one practice I have endeavoured to carry through, and often successfully, is this:—

In the first place, a subscriber's fee has to be paid by the owner of the animal. A practitioner having under his care an animal for which he wishes to get advice or assistance from the College can send an animal in, not as his property, but becoming responsible for the payment of the subscriber's fee, which he, in turn, can collect from the owner. So that a practitioner, by paying the subscription, though *he could not avail himself of the services of the College* for 50 cases of so many owners for the one guinea (laughter) could tell the owner that he was getting that extra assistance from the College, and the patient could be admitted to the College infirmary. He would charge accordingly." He had frequently done that, but it must be understood that the animal was entered in the name of the veterinary practitioner who sent it, and in this way he would retain his client.]

Continuing, Mr. Willett said that several people had mentioned how pleased they were that veterinary Advisory Officers had been appointed. His first experience of them —and also that of several general practitioners of his acquaintance—was that these were most unfortunate appointments, but evidently the rules of their appointment and their duties had been considerably altered, and he presumed they owed that alteration either to the "National" or to the R.C.V.S. He quite agreed that it all depended on the individual, and in his view the younger men (of whom he was one) had unfortunately not the tact, in the way of managing men older than themselves, that was possessed by their elders; therefore, he did feel strongly that those positions should not be filled by men who had just left College.

It was mentioned some time ago by another practitioner that one of the gentlemen who was appointed had never seen the double intradermal tuberculin test carried out: that was fairly damning evidence that the wrong man had been appointed to the position.

Another Fellow had spoken about the word "vivisection": as he had said, many did not understand its meaning. It was not so long ago that he was asked to put a dog to sleep and, knowing the lady to whom it belonged and expecting a little trouble, he suggested that he should take it away, when she exclaimed: "Don't do that! They might do some vivisection experiments on it when it is dead." (Laughter.)

Major Taylor, speaking in his capacity as inspector, had said that he always gave support to the general practitioner: he (Mr. Willett) thought that should be done more commonly. He was not only speaking of veterinary surgeons to the local authority, but also of people working under the Ministry. In his district they had had trouble through young men who did not realise what they were up against. It was all a question of tact, and half the questions that were asked had a double meaning, as far as he could see. That brought them back again to the Veterinary Advisory Officer, who would have to be careful that he did not answer, in one way, a question from the point of view of the veterinary surgeon that could also be answered in another way when it came to the point of view of the general practitioner. (Hear, hear.)

Major Taylor had stated that he did not know that the Royal Veterinary College had insisted on students seeing practice during vacations. His (Mr. Willett's) actual words were "Now that the R.C.V.S. has made a move to insist on its students seeing practice outside during vacations," therefore he thought there was a slight misunderstanding.

He desired to thank them again for their kindly reception of his paper.

"The Highway Code, the praiseworthy effort of Mr. Herbert Morrison, the Minister of Transport, to develop road-mindedness in every user of the King's highway, has been completed and copies may be obtained, price 2d., from H.M. Stationery Office, Adastral House, Kingsway," writes the Motoring Correspondent of the *Daily Mail* in a recent issue of that paper.

"One important amendment concerns led animals. The Code originally provided that they should be on the left of the highway; now it states that the usual practice is to keep to the right so as to face oncoming traffic."

The Veterinary Record.

March 28th, 1931.

Standardisation and Control of Veterinary Biological Products.

In the previous issue of the *Veterinary Record* we published extracts of important papers on the above subject which were presented to the Eleventh International Veterinary Congress by Dr. Mohler, Dr. Eichhorn and Dr. Flueckiger. In these communications special attention was directed to the vital importance to the veterinary profession of a proper control of biological products; moreover, it will be remembered that at the close of the Session, the following resolution was passed:—

"That the attention of the Office International des Epizooties at Paris be drawn to the urgent necessity of a prompt consideration of the question of the standardisation of biological products."

Veterinary surgeons in the British Isles are in a far less fortunate position than those in many other countries. In the United States of America, for example, thanks to the foresight and energy of the Bureau of Animal Industry with the backing of a sympathetic Government, many biological products are under State control and the veterinarian knows that by dealing with accredited manufacturers, he is ensured of supplies of vaccines, sera, tuberculin, etc., which will conform to definite standards laid down and enforced by the Bureau. Official testing is also undertaken by the Governments of certain other countries. It is to be regretted that in this country, notwithstanding the emphatic and repeated requests of the profession, it has not yet been possible to convince the legislative authorities that some form of control is imperative.

At the present moment no obligation is placed upon manufacturers to standardise products intended for veterinary use, and, in consequence of this immunity from any form of supervision, it is only too apparent that many substances may be placed on the market which are almost, if not entirely, valueless. We wish to point out that the veterinary profession is entrusted with the responsibility of the eradication and the prevention of spread of many contagious diseases, and in this task relies very largely upon a variety of biological products. For example, we possess, in tuberculin and mallein, preparations of approved value in the control of tuberculosis and glanders. The practitioner is entirely dependent upon the potency of these products for the accuracy of his results, and it is unreasonable to expect him to interpret these tests unless he has some guarantee that these substances have been properly standardised. We would urge upon the

Ministry of Agriculture the pressing necessity of bringing veterinary biologics under State control. We consider that commercial firms of repute in this country would not be adverse to such a step, for many already take the greatest care in the standardisation of their products, and have accordingly built up reputations of which they are justly proud.

But apart from the responsibility of the State to the veterinary profession, there is a wider aspect of the problem which demands consideration. The important observations of Mohler and his co-workers that certain consignments of imported vaccine lymph were contaminated with foot-and-mouth virus and were responsible for outbreaks of this disease, are too well known to require elaboration. This indicates very clearly that, in the absence of strict supervision, there may be a risk of the introduction of serious diseases, and we feel that, in the interests of the animal population of this country, this side of the question merits a very careful enquiry.

It would seem to be equally desirable to limit the supply of certain products to members of the veterinary profession. It should be obvious that the handling of preparations containing living virus, *e.g.*, distemper virus vaccine, swine erysipelas culture, etc., by the layman is a practice fraught with the gravest danger. It should be the duty of the State, by preventing the indiscriminate distribution of these products and by limiting their sale to those who realise their potential dangers, to safeguard the stockowner against such risks.

Milk in Schools.

The National Milk Publicity Council estimates that approximately 10 per cent. of the school-children of England and Wales are now taking milk as a regular part of the daily school routine, and that something like 5,000,000 gallons annually are consumed in this way. The Council and all those co-operating with it are to be heartily congratulated on this work, which is of considerable value to producers in providing an additional outlet for milk, and of even greater value to the children in supplying them with the best of all foods at the age when they can derive most benefit from it. The customary allowance is one-third of a pint daily, which is supplied in a bottle (together with a straw) for a penny; even at this modest rate each child is a consumer of nearly 10 gallons yearly, and it is not altogether unreasonable to suppose that a beneficial habit contracted in childhood will, in many cases, persist in after-life. Farmers should have no hesitation in making financial contributions to the work of the Council. In many cases they can do even more by getting into touch with local school-teachers and education authorities and offering a supply of milk where none already exists; the Council is prepared to assist approved suppliers in every possible way. A certain amount of trouble is involved in making the daily delivery and in arranging for other means of disposal during holidays and at week-ends; and it goes without saying that a high standard of cleanliness and purity must be maintained. But the market is a big one and is well worth developing.—*The Times.*

Eleventh International Veterinary Congress, London.

August, 1930.

(*Continued from page* 309.)

Veterinary Science in Relation to Public Health, with Special Reference to the Production and Distribution of Meat.

By Professor Dr. von Ostertag.
Ministerialrat in Württbg, Innenministerium, Stuttgart, Germany.

The domain of veterinary science is not strictly limited to the treatment of sick animals alone; manifold and important are the duties devolving upon a veterinarian in connection with the administration of public health and in preventing and checking animal diseases transmissible to man. Among those one can mention, glanders, anthrax, rabies, foot-and-mouth disease, Malta fever, Bang disease, and tuberculosis. The improvement in diagnostic methods of recognition of these diseases did much to prevent their spread in civilised countries, whilst intensive research is being carried on everywhere to solve the problem of prevention and vaccination in tuberculosis. Besides diseases attacking the live animal passing to human beings through contact with infected live stock, many are the ailments that might be caused by consumption of unsound meat and its products or by invasion of the human organism with zoo-parasites (helminths.)

The production of sound meat would have been an easy matter if farmers had reared disease-free live-stock; natural conditions, however, render most difficult, or even well nigh impossible, the rearing of absolutely healthy food animals, owing to the incidence of numerous diseases among beasts constituting the raw material of the meat industry.

It is the first duty of Veterinary State Medicine (veterinary policy) to prevent the spread of the disease by live-stock, their meat and products prepared therefrom. Frontiers should be closely guarded against importation of rinderpest, bovine contagious pleuro-pneumonia and foot-and-mouth disease not only with the live stock but also with the carcasses and their parts. Besides a body of trained men supervising the traffic in animals and their products along the land frontiers or in ports, a modern State should possess an adequate force of experienced veterinarians to watch and administer the veterinary sanitary laws inland. Before notification of this or that disease is made compulsory the authorities should consider whether the carrying out of the necessary veterinary police measures would not inflict greater economic losses than the disease itself. Payment of an adequate compensation for the slaughtered diseased live-stock or for the rejected carcasses goes a long way to ensure co-operation between the owners and the Government veterinary surgeons.

In many countries rinderpest, bovine contagious pleuro-pneumonia, sheep-pox and sheep scab were practically or altogether exterminated by means of veterinary sanitary measures alone; blackleg and anthrax were fought by prophylactic inoculations, and the danger of new importation of the latter disease into hitherto free countries was greatly alleviated by an international agreement relative to the inspection, testing and disinfection of hides, skins,

hair, bristles, bone and bone-meal, etc. The extraordinary development of international trade in eggs and poultry brought to the fore in many European countries the question of veterinary sanitary control of fowl cholera and fowl plague; avian pox and helminthiasis are also successfully combated by individual owners with the aid of hygienic measures alone.

Foot-and-mouth disease, responsible for enormous economic losses in the countries of the Old and New World, is successfully controlled in England, U.S.A. and some other countries by the stamping-out method, whilst in Germany and some other countries veterinary police measures combined with passive and active immunisation are employed for its eradication.

Of the diseases of meat producing animals, swine fever is one of the most difficult to control. In the countries where it exists the annual coefficient of increase varies from 90 to 100 per cent. only, whereas in the countries that are immune the increase of the herd may be as high as 150 per cent.

Bovine tuberculosis is another disease of meat producing animals responsible for many losses of the farmer. If one remembers that bovine tuberculosis can be transmitted to the pig and man one easily will understand why its combating and prevention became the chief concern of all those connected with agricultural industry.

The author, after reviewing well-known methods of elimination of tuberculosis with the aid of tuberculin, as practised in the west of the U.S.A. and Canada, discusses at some length Bang's plan of creating disease-free herds in Denmark and Sweden. He thinks that recent experiments of vaccination with B.C.G. deserve serious consideration if combined with preventive hygienic measures according to Bang.

Next in importance, from the point of view of public health, come the diseases of reproduction and of young stock. Germany leads the world in this respect, for the Government set up a special organisation for combating those diseases in 1923 under the chairmanship of Professor Miessner.

Helminthiases of sheep, cattle, pigs and poultry are very important by reason of the economic loss incurred by the breeder and the danger to the public health.

Deficiency diseases--avitaminosis and mineral deficiency --cause an enormous loss to the producer of meat, as they are responsible for a high death rate among young animals and bring about sterility in breeding stock.

Because of his knowledge of the physiology of food animals, a veterinarian is alone qualified to give advice on best methods of animal nutrition. Production of early maturing races of food animals—the problem so important for the economics of animal husbandry—should be made possible with the modern knowledge amassed by veterinary science.

The supervision of the sale of meat is a purely veterinary duty. This deals with the detection of animal diseases which are transmissible by ingestion to man, or which render the meat unsuitable in some other way for human consumption. The supervision of the sale of meat is associated with veterinary inspection of animals for slaughter and of meat, and also with the veterinary control of food stuffs.

The inspection of animals for slaughter and of meat obviously forms the first line of defence of the human subject against the dangerous animal parasites, anthrax, rabies, glanders, Malta fever, tuberculosis and the diseases causing meat poisoning. The uniform method of examining animals and meat is ensured by obligatory regulations regarding the examination of animals before and after slaughter, the transport of animals, and the erection of slaughterhouses, at least in the larger communities. This examination of animals and meat must be supplemented by the veterinary control of foodstuffs, which includes the detection of unauthorised preservatives and of adulterations, and also of game, birds, fish, amphibia, etc.

The remarkable results which have been obtained in connection with the control of diseases which are transmissible from animals to man, and particularly of *Tænia saginata* and *Tænia slium, Cysticercus cellulosæ, Trichinella spiralis,* and other diseases, including meat poisoning, shows the importance of veterinary control in the meat trade.

H. F.

Principles (Administrative and Scientific) of Meat Inspection Law, with Reference to International Conditions.

By Dr. H. C. L. E. Berger.
Director of the State Veterinary Services and Chief Veterinary Officer of Health, The Hague;
AND
Dr. H. S. Frenkel.
Director of the Veterinary Division of the Central State Laboratory of Public Health, Utrecht, Netherlands.

Part I.

Dr. Berger deems it is necessary, as a basic and essential principle, that every country should have compulsory meat inspection in relation to public health under Meat Inspection Acts, and points out that this was agreed to at the International Veterinary Congress of 1909.

He states that in many countries having no such legal regulations, municipal meat inspection services have been established, but they labour under difficulties because meat is received from uninspected areas and there is a lack of uniformity in forming judgments; therefore, there ought to be universal inspection of meat by legal measures—such laws and regulations, should, as far as possible, be practicable and not idealistic, the latter being difficult to enforce.

Inspection of all Slaughtered Animals.

Berger urges that all animals used for human food should be inspected, and special regulations should be framed if fish, poultry and game are to be included. This also was agreed to at the International Congress of 1909. Attention is called to the lack of inspection of animals which have died, the danger to public health arising therefrom, and the need for the veterinary profession to do all possible to have compulsory examination of the carcasses and organs of such animals.

Agriculturists, as a general rule, object to all those regulations, but in time, agree to their necessity if tactfully carried out.

With regard to slaughtering animals for private use, and the claim that there is no necessity for their official inspection, the following definition is suggested for that

exemption: "That the animals have not died or been killed in a emergency and whose meat is intended or is used exclusively by the occupants of the premises where the animals have been slaughtered, provided the occupants are not engaged in the business of a butcher or of preserving or preparing meat or meat products for sale, and provided, also, that they do not live in institutions or establishments destined either exclusively or *inter alia* for the supply of food or where food is regularly supplied."

Administration by the State or by the Municipalities.

Dr. Berger, while of the opinion that the Act should be carried out by Government Officials, agrees that both forms of administration are possible, but municipal inspection should be under close Government control; for example, in Holland it is carried out in the latter way, so that the standard and similar rules are in force throughout the whole of the country.

Qualification of Inspectors.

Veterinary surgeons are the most suitable persons for the inspection of meat, in view of their special study and training. This axiom was also recognised by the Congress of 1909; at the same time, it was recognised that specially trained lay inspectors could perform very useful work as assistants to the veterinary surgeons, thus reducing the cost of inspection.

Should Inspecting Veterinary Surgeons be Full-time Officials?

The answer is "Yes," wherever possible. This is the opinion of Berger after eight years' experience. He is careful to point out that nothing but praise is due for the manner in which part-time officers have carried out their duties and urges that wherever a change from part-time to whole-time officers is made, it should be gradual, so as not to penalise the part-time officer.

Organisation.

The Public Health Services in Holland are controlled by a Director-General, who is a lawyer.

The Inspectors-in-Chief are:

(*a*) Two medical men: one for Contagious Diseases of Man, one for Tuberculosis in Hygiene of Children.

(*b*) One civil engineer for Housing Hygiene.

(*c*) One Pharmaceutical Chemist, for the Food Act, Soil, Air and Water.

(*d*) A Veterinarian for the Meat Inspection Act, Meat Hygiene, and Director of Veterinary State Services. (Contagious Diseases of Animals Acts.)

Enforcement of the Law.

The Act should contain provisions enabling Government Inspectors to compel local authorities, by force if necessary, to observe and carry out the legal meat inspection regulations.

Hygienic Regulations Regarding Abattoirs, Establishments and Transport.

It is essential that proper hygienic requirements should be framed in reference to all establishments where animals are slaughtered, meat kept, preserved or prepared, whereby products are dealt with, and, in addition, to all that concerns the transport of meat and its handling.

Public Abattoirs.

Public Abattoirs should be established wherever possible, although it may be good policy, in some cases, not to make them compulsory—for example, in Holland there are, at present, 72 public abattoirs, large or small.

Disposal of Condemned Meat.

From an economic point of view it is of great importance that valuable technical products be made from condemned meat. In Holland, provision has already been made for this in more than one-third of the country.

The most scrupulous precautions should be taken to ensure absolute separation between edible and non-edible foods in separate establishments, and all waste water and liquids should be sufficiently disinfected.

Denaturation of condemned meat and meat products should take place with the utmost care, by thermic, chemical or thermo-chemical treatment, so that the condemned products are either broken up into simple elements, or burned so far that only ashes are left. It is strictly necessary that all living germs be destroyed.

Humane Slaughtering.

Regulations as to the methods by which animals are to be slaughtered should not be omitted.

Emergency Slaughtering.

Special attention should be given to animals that have died or been killed in emergency. (This is specially dealt with in Part II.)

Meat Products.

Special regulations are very necessary concerning the preservation and preparation of meat and meat products.

Importation of Meat.

The inspection of home meat, while necessary, would be but incomplete if the inspection of imported meat was left entirely free. Therefore the Act should give the Government power to indicate certain centres for the importation and inspection of meat and meat products.

Meat and meat products have gradually become important items of international traffic. Uniform regulations should, therefore, be framed, with special regard to chilled and frozen meat, and the handling of such meat in a hygienic manner, because infections may arise which are not easily recognisable in the importing country. A reliable system of marking of meat will likewise be necessary.

The only sound basis on which international meat inspection could be founded, is on science.

At present there are some International Corporations in existence in the veterinary-hygienic field, among which we may mention:—

(*a*) The Veterinary Sub-committee of the Economic Commission of the League of Nations.

(*b*) The "Office International des Epizoöties," and "Conseil Scientifique Agricole" of the "Institut International d'Agriculture" at Rome, whose Department of "Produits des Animaux" deserves special mention.

The International Refrigeration Congress is also considering the question of the international regulation of meat hygiene.

It is absolutely essential that the inspection of meat to be exported from one country into another, should take place under the regular supervision of Government officials.

We are of opinion that if both the exporting and the importing countries conduct their meat inspection and

everything connected therewith, in a sound and scientific manner, so that it may be concluded that there exist no differences in this respect, such countries may admit each other's meat without stipulation as to its being accompanied with the organs. That this view is shared with others, appears from the resolution passed by the " Conseil International Scientifique Agricole " in 1927, at Rome, which was to the following effect :—

> " L'inspection des viandes doit être reglementée sur des bases légales analogues dans les différents pays; les prescriptions sanitaires à imposer en matière, d'exportation des viandes (y compris viandes congélées, refrigérées) doivent l'être d'après les bases d'un accord international; les pays qui ont déjà les mesures sanitaires indiquées sont invités a permettre dès maintenant des importations réciproques en attendant la promulgation d'un accord international."

That is :—

> " The inspection of meat ought to be regulated on legal bases similar in all countries; the Sanitary Regulations to apply to all exported meat and meat products (including frozen and chilled meat) ought to be on an international basis; the countries which already have the sanitary measures indicated, are invited from now to permit reciprocal importations until international arrangements have been made."

The international regulation of meat hygiene is highly desirable, not only in view of the international trade in meat and meat products, but also as a stimulus and support, as a guidance for those countries where the initiative is still lacking for the introduction of meat inspection.

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Part II.
The Scientific Principles of Meat Inspection Law.

By Dr. H. S. Frenkel.

Director of the Veterinary Division of the Central State Laboratory of Public Health, Utrecht, Netherlands.

Meat inspection should be performed according to principles derived from the actual standpoint of medical veterinary sciences, which are necessary for the execution of a rational meat inspection. These principles are applied in the Dutch Meat Inspection Law.

By relying on, and applying, these sciences we can protect the public against meat and meat products that are noxious to health.

The problem of so-called meat poisons, *e.g.*, infections with *Bac. paratyphosus* B. and *Bac. enteritidis* Gärtner, is still very mysterious for the hygienist concerned with these problems.

Thanks to improvements, bacteriological and serological, our knowledge of the paratyphoid group has advanced a good deal, but we have not made much progress regarding the pathogenesis of the sporadic cases of meat poisons that occur now and then in spite of the Meat Inspection Law.

Thanks to the operation of the Meat Inspection Law, which provides that all slaughtered animals are liable to inspection, endemics of any importance have totally disappeared.

On the single occasion when we observed an extended endemic of meat poisoning in our country, we were able to demonstrate that there had been an evasion of the Meat Inspection Act, *i.e.*, that a dead or diseased animal had been withheld from meat inspection.

Thanks also to meat inspection, the number of tape worm invasions has diminished considerably in Holland, and the same can be said with regard to echinococcosis.

The applied methods of inspection, are, of course, not peculiar to Holland alone, but resemble closely those followed in some other countries. A description of the methods of a routine inspection would therefore be superfluous.

Our aim is to pass for consumption as much as is possible scientifically, so that no sound food may be wasted; on the other hand, to guarantee that the food is innocuous to public health, our inspection regulations require a bacteriological examination of almost every animal that has been slaughtered in emergency.

If a bacteriological examination of such animals cannot be carried out, no matter from what causes, condemnation of the carcasses must follow : obviously such bacteriological examinations must be entrusted to highly trained and conscientious men.

In addition to cases of emergency slaughtering, bacteriological examination is prescribed in all cases in which, in our opinion, it is necessary.

Our inspection regulations are set forth in a ministerial decree authorised by a Royal decree as prescribed by the Meat Inspection Act, with reference to the list of diseases, and alterations, and how to consider them. This decree gives directions as to the decisions to be taken after inspection, in combination with the bacteriological examination, and also in other cases than slaughterings of emergency, *i.e.*, septic or pyæmic conditions. We are of opinion that the whole carcass must be condemned when the meat contains germs :—

(1) By reason of septicæmic conditions.

(2) By bacterial invasion (saprophytic or parasitic) after death, which occurs especially in animals where evisceration has not immediately taken place.

As cases belonging to the latter group include carcasses which are carrion, which must be condemned, only the first group remains to be discussed. This group may be divided into one of the specific, and one of the non-specific, bacteræmiæ, *e.g.*, red fever, anthrax, paratyphoid fever, colibacillosis. The second group include such septic conditions as occur after wound infections, infections of the uterus, etc., usually caused by streptococcoci and staphyloccoci.

The so-called septic condition is caused more frequently by bacterial toxins than by the micro-organism itself.

Even after sterilisation we are not sure that such meat would be fit for mankind, because of thermo-resistant toxins.

The question may be asked " which germs pathogenic for animals can we consider as harmless for human beings? "

Up to a short time ago, we certainly should have included the *Brucella* Bang, but researches elsewhere, as well as in our own country, have proved that it is not at all a harmless germ to mankind.

We have tried to find out the minimum requirements for a laboratory examination which could be trusted to every veterinarian; therefore, it was advised that two agar slopes and one tube of glucose broth should be used. This small number of nutrient media is sufficient for practical purposes, because most of the known pathogenic germs

grow rather quickly on this media. Even an anærobic micro-organism can be demonstrated in this way.

Which Organs must be taken for Bacteriological Examination?

It is not advisable to use the same organs for each bacteriological examination, but to make our selection according to whether the animal has been examined alive or not.

We find that the muscles generally are less suitable to demonstrate septicæmia than many internal organs.

We have also found out that it may be dangerous to draw conclusions from the examination of only one organ.

We have also found that, in animals that have died or were slaughtered after a lingering illness, bacteria should be expected in different organs and mostly that these bacteria are non-pathogenic. They are chiefly saprophytic intestinal bacteria, which invade the organism through the lymphatic and blood vessels.

One can generally cultivate micro-organisms from the liver because of its communication with the intestinal tract, and the kidneys are very soon infected after death.

In cases of emergency slaughterings bacteriological examination of the spleen only is not sufficient.

When we find a micro-organism belonging to the pathogenic germs, then, as a rule, infection has started during the life of the animal. The examination in cases of meat poisoning differs greatly from the ordinary meat bacteriological examination; the former is much more complicated and, as a rule, it demands much more time.

Ante-mortem Examination.

Opinions differ widely as to the usefulness of inspecting living animals in relation to the *post-mortem* judgment.

We, after experience, have decided that the inspection of living animals is necessary in our system of examinations and that for various reasons, and the experience of our inspecting veterinarians and State inspectors has confirmed our opinion.

Frequently, we find that an animal has a high fever and looks very ill, while the pathological anatomical changes are so slight that one would not think them sufficient to explain such severe clinical phenomena, and if the animals had not been seen alive, a bacteriological examination would perhaps not have been made. Again, in many cases of lameness observed in the living animal, a very scrupulous examination of the limbs was necessary; in that way, many cases of foot-and-mouth disease in the pig, foul in the foot, and deep-seated muscle abscesses in cattle have been found, as well as fractures in the pig, that very probably would have passed unobserved if there had not been an examination of the living animal, and we may include cases of black-leg.

T. D. Y.

Experiments on dogs have shown that venom from snake bite can be extracted by suction over skin incisions. Enough toxic serum has been thus extracted from a snake-bitten dog to kill four other dogs, the autopsies of which showed typical snake-bite death; while the original dog recovered. The average Texas rattle-snake can expel 220 mgm. of venom. One ampoule of antivenin neutralises 10 mgm. of venom in the animal body.—D. Jackson (*Southern Med. J.*, 22, 605; through *Biolog. Abstr.*, 1930, 4, 2313, Ex. *Pharm. Journ.*).

Clinical and Case Reports.

Mucous Cast from the Small Intestine of a Heifer.

By Walter Scott, M.R.C.V.S., D.V.S.M., Edinburgh.

The subject of this report was a three-year-old Ayrshire heifer, five months calved, a member of the "certified" herd owned by the Corporation of Edinburgh.

The first indication that there was anything amiss with this animal was the fact that, on the forenoon of February 25th, the dung was thinner than normal. Considerable uneasiness was manifested by the animal throughout the day and she made frequent attempts to get her head round to her hindquarters. This heifer had a milk yield of three gallons per day, but on the morning of the 25th her yield dropped 3½ lbs. Apparently she had suffered from acute diarrhœa during the night of the 25th/26th, and, when seen at 5 a.m. on the 26th, she was straining violently and passing fæces which had the appearance of coloured water. Following a very severe attack of straining, the heifer passed a mucous cast approximately fourteen feet in length and half-an-inch to a quarter-of-an-inch in thickness. The cast had a fœtid smell, was yellowish-white in colour, and, when passed, looked like a bunch of tape-worms. It was easily broken by slight tension and was not tinted with blood. From its appearance it was concluded that the cast was from the small intestines. The milk yield in the morning was only 5 lbs. When the heifer was seen at 10 a.m. her temperature was 103° F., but she was feeding and ruminating in a normal manner. All straining had ceased, although the fæces were still thin. Later in the day the fæces were formed and it was seen that a very small amount of blood and mucus was mixed with the fæces, and, after the fæces were passed, about a tablespoonful of blood was voided when the anus was finally contracted. There was an increase in the milk yield the evening of the 26th. There was a further increase on the 27th and, on the 28th, the animal was normal in every respect.

The only treatment adopted was a restriction in the diet of the animal and two doses (℥viii) of liquid paraffin administered during the day following the passage of the cast.

I have been unable to form any opinion as to what could have caused the sloughing of such an extensive area of the intestinal mucosa, or why there should have been so little general disturbance manifested by this heifer.

An Unusual Calving Case.

By John D. Peele, M.R.C.V.S., Durham.

I was called out at 8 p.m. on February 26th to see a newly-calved cow. The owner stated that she had calved that morning at six o'clock, and that he himself had helped her. The calf was alive and the cow had cleansed within half-an-hour. The cow, however, was not giving any milk. I examined the udder and found it to be just like that of a cow about a fortnight before calving.

Abstract.

[**The Use of B C G in the Vaccination of Calves against Tuberculosis.** Buxton, J. B., and Griffith, A. Stanley, Cambridge. *Lancet*, February 21st, 1931.]

In this "interim report," the authors commence by giving a summarised account of the work and conclusions of Calmette and Guérin with their vaccine against tuberculosis—the vaccine being derived from an originally virulent bovine strain of tubercle bacillus cultivated for many years on potatoes soaked in five per cent. glycerin ox bile, which after 230 subcultures had become attenuated and harmless. Calmette and Guérin claim that the organism is incapable of producing progressive tubercles or of regaining its original virulence; that when introduced into the bodies of young animals it produces a firm resistance against a subsequent infection with virulent strains of the tubercle bacillus; that the immunity is dependent upon the persistence of B C G in the lymphatic system, and that its duration is inseparable from the presence in the tissues of the living vaccinating organisms, which in the bovine animal disappear in the second year after vaccination. The authors give a brief summary of the work of other investigators, some supporting and others not confirming the claims of Calmette and Guérin.

The authors discuss in detail their methods of procedure in testing the resistance conferred by the administration of the vaccine in various doses and by different channels in the course of six series of experiments and full details are given of the *post-mortem* findings in all the vaccinated animals that died or were killed as well as in the controls and the duration of life after the resistance test. The tables reveal that most (not all) of the vaccinated animals lived longer than the controls, but that in a large proportion the lesions were nevertheless extensive.

The authors' summary and conclusions are as follow:—

Summary of Experiments.

Fifty-one calves were vaccinated with B C G by various methods—10 by feeding, four intratracheally, three subcutaneously, and 34 intravenously—and were subsequently tested as to their resistance to tuberculosis, together with 14 untreated calves, by the intravenous injection of fully virulent bovine tubercle bacilli in doses ranging from 1 mg. to 0·25 mg. of culture. All the 65 calves had been previously tested with tuberculin by the double intradermal test and had not reacted.

Controls.

Five control calves received each 1 mg. of bovine tubercle bacilli and died in from 15½ to 27 days (average 20 days) of acute miliary tuberculosis. Seven calves received each 0·25 mg. and died in from 18½ to 27 days (average 24 days) of general miliary tuberculosis. Two calves were inoculated with smaller doses—namely, 0·1 mg. and 0·05 mg. respectively—and died of severe general tuberculosis in 39 and 60 days. Vaccinated calves were not given doses of less than 0·25 mg. It may be said, therefore, that they received at least from 5 to 20 times the dose necessary to cause fatal general tuberculosis in normal calves.

Effect of Vaccination.

Feeding.—The vaccine was administered to six calves by pipette into the mouth in doses ranging from 0·5 to 2·1 g. Three of the calves showed no higher resistance, amounting in one instance apparently to complete immunity. This animal subsequently had a calf (now 12 months old) which was reared entirely on its mother. It does not react to tuberculin and may therefore be presumed to be free from tuberculosis. Four calves were fed with B C G in the milk. The resistance of two of these calves was a little higher than that of the controls while that of the remaining two was much higher.

Subcutaneous Inoculation.—Three calves were vaccinated in this way. One showed little, if any, increased resistance, and one showed slightly increased resistance. The remaining one exhibited a moderately high degree of resistance.

Intratracheal Injection.—Four calves received directly into the trachea doses of B C G ranging from 50 to 925 mg. One of the calves which had received a single dose of 50 mg. was tested 50 days after vaccination and died 19 days later (controls 15·5 days). A second calf was vaccinated twice, the total amount of B C G being 60 mg. and died of tuberculosis 28 days after the test. A third calf which had received 775 mg. of B C G in five doses given during a period of 2½ months died 97 days after the test inoculation of tuberculosis limited to the thoracic organs. The remaining calf which also received five doses of B C G, the total amount, however, being 925 mg., exhibited a high degree of resistance. The animal—a heifer—is alive nearly two years after the test and has a calf.

Intravenous Inoculation.—Thirty-four calves were vaccinated intravenously and all except one showed increased resistance, but there were great individual variations in the degree of resistance. One calf which had been given a single dose of B C G exhibited only slightly increased resistance. Thirty-two calves were vaccinated twice, the first dose of 10 mg. being followed 21 to 24 days later by 20 mg. in one instance, 50 mg. in seven instances, 75 mg. in four instances, and 100 mg. in 20 instances. Eleven of the 32 calves died or were killed when dying in from 33½ to 73 days (average 52·3 days) of tuberculosis, severe in the lungs and thoracic glands, and slight or not apparent elsewhere.

One calf was killed on account of ringworm 92 days after the test and showed chronic general tuberculosis not severe. Ten calves were killed because of meningitis 132 to 317 days (average 240 days) after the resistance

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On looking at the cow and palpating her abdomen I came to the conclusion that there was another calf, and, on examination *per rectum*, I felt a well-developed living calf. Vaginal examination revealed the *os uteri* to be completely closed and covered with a mucous seal; also, the ligaments in the pelvic region had tightened up. I expressed the opinion that she might carry the calf for a week or more, and left.

The cow calved her second calf on March 9th. It was alive and the cow came straight on to her milk and is now giving over four gallons. I found out that the cow had been running with a bull, had apparently broken to her service and had been served a second time. Unfortunately they did not know the dates of either service.

There was no possibility of there being any mistake, as the owner is a reliable man and, also, there was not another cow in calf in that part of the byre.

test; besides tuberculosis of the meninges there were disseminated lesions in other parts of the body, for the most part slight and not progressive.

One calf was killed 245 days after the test because of cerebral symptoms and showed tuberculosis of the bones of the skull and a vertebra and general nodular tuberculosis, not severe. One calf was killed 316 days after the test because of paralysis of the hind limbs; the autopsy showed three tuberculomata in the cord with secondary involvement of the iliac glands and no signs of tuberculosis elsewhere. Two calves lived 570 and 636 days after the test; one showed on *post-mortem* examination slight retrogressive tuberculosis, the other moderate general tuberculosis. Five calves are still alive.

One calf was vaccinated three times, receiving 5, 10 and 50 mg., the intervals between the doses being 7 and 14 days. Tested eight weeks later the calf was less resistant than the controls. This is the only instance of no increased resistance after intravenous vaccination.

With regard to the degree of protection afforded by different doses of B C G intravenously, it is interesting to note that only 50 per cent. of each group of calves vaccinated with 10 and 50 mg. and 10 and 75 mg. respectively showed a high degree of resistance to the test bacilli, whereas 75 per cent. of the 20 calves vaccinated with 10 and 100 mg. of B C G were highly resistant.

The actual cause determining the death of the great majority of the resistant animals was tuberculosis of the central nervous system; this was due to the fact that the test dose, consisting of a large number of highly virulent tubercle bacilli, was injected intravenously, a few of the test organisms thus gaining access to the central nervous system where they were able to produce lesions owing to the low degree of resistance common in this situation. The tuberculosis elsewhere was not severe.

These results are much more encouraging than may appear at first sight. It must be remembered that although the test doses employed throughout the experiments were exceedingly severe the life of 23 of the 51 vaccinated animals was prolonged for periods ranging from eight months to three years, and the great majority of the remainder showed definitely increased resistance. There is little doubt that a less severe test dose administered so as to resemble more closely a natural infection would have given more spectacular results. It is proposed to adopt the former course in future experiments, since we are now satisfied that a high degree of immunity can be induced in calves when B C G vaccine is used in the most appropriate manner.

Conclusions.

(1) The strain of B C G used throughout these experiments would appear to be avirulent for the calf and incapable of giving rise to progressive tuberculosis, even when inoculated intravenously in large doses. (2) Whether given by the mouth or intratracheally, or by subcutaneous or intravenous injection B C G can raise the resistance of a calf to a virulent experimental infection. (3) An increase of resistance is less certain after feeding with B C G than after intravenous injection, though feeding with the vaccine may in some instances induce as high a resistance as injection into the tissues. (4) Intravenous injection, in our experience, has proved the most satisfactory method of vaccination with B C G. (5) The degree of increased resistance conferred upon calves by intravenous vaccination varies within wide limits, and appears in general to be directly proportionate to the dose of B C G vaccine.

Duration of Increased Resistance.

Our experiiments were, in the first instance, concerned with questions of the best method of administratiion and dose of B C G The tests of resistance were made therefore after an interval when one might suppose that the resistance was at its highest level, that is from two-and-a-half to three months from the beginning of vaccination. In future work we propose (*a*) to ascertain the duration of the increased resistance produced by intravenous vaccination; (*b*) to test the resistance of intravenously vaccinated calves against a natural mode of infection; (*c*) to compare the resistance produced by other antigens.

G. H. W.

N.V.M.A. Divisional Reports.

Central Division.

Professional Problems Discussed at Red Lion Square.

An admirable and thought-provoking paper by a new essayist—Mr. R. A. Willett, of Staines—entitled "Some Problems of the Veterinarian," was the chief feature of a meeting of the Central Veterinary Society which was held at 10, Red Lion Square, W.C.1., on March 5th, 1931.

The President (Captain G. Dunlop Martin) occupied the chair, and there were also present Captain L. S. Balls, Messrs. A. J. Beeson, W. Brown, R. E. C. Bullen, H. E. Bywater, Major W. Denington, Mr. S. Gourley, Mr. J. W. H. Holmes, Mr. Herbert King, Mr. H. C. P. King, Major H. Kirk, Captain W. J. Leyshon, Professor James McCunn, Major E. Montgomery, Messrs. W. Perryman, J. H. Poles, F. Proud, Miss K. W. Shedlock, Captain R. J. Stow, Major F. J. Taylor, Messrs. J. Willett, R. A. Willett, Professor J. G. Wright, Professor G. H. Wooldridge and Captain J. F. Macdonald (Hon. Secretary). Mr. J. M. Armfield and Major R. H. Stalker were present as visitors.

The Hon. Secretary having informed the meeting that the minutes of the February meeting of the Society had not been entered in the minute book, as they had not yet been published in the *Record*,

Professor J. McCunn asked the reason for the non-publication of the minutes. They had all been waiting for the account of the very interesting lecture given by Dr. Laidlaw (who took Major Dunkin's place) which he was sure they could follow better in print than at the meeting. He understood they were a division of the N.V.M.A., and that the "National" were in duty bound to publish their minutes. Previously they had invariably been published before the next meeting. He desired to know why on this occasion they had not been published.

The Hon. Secretary replied that, first of all, he should like to say that it was by no means invariably that the minutes were published before the next meeting. On this occasion, however, a paper should have been read by Major Dalling, but for some reason Major Dalling and Major Dunkin had to change dates. When Major Dunkin stepped in to fill the breach, the latter informed him at the

time that it would not be possible to publish the minutes until they had officially published their results. That was made quite clear at the time.

Professor McCunn enquired when the authors were going to publish their findings, the Hon. Secretary replying that he did not know.

Correspondence.

(1) From Sir John Bland Sutton, Mr. G. P. Male, Captain S. J. Motton, Mr. H. L. Roberts, Mr. E. L. Stroud and Captain W. K. Townson, regretting their inability to attend the meeting.

(2) The Hon. Secretary observed that there was a most welcome letter from Lieut.-Colonel T. Dunlop Young, who resigned at the beginning of the session. Although his resignation was accepted Sir John Moore had been good enough to see him in the meantime, and Colonel Young has reconsidered his decision and consented to remain a Fellow of the Society. (Applause.)

(3) From Major Soutar, who had left London for Edinburgh, resigning his Fellowship.

(4) From the National Horse Association of Great Britain, items in which were mentioned by the Hon. Secretary. One was a statement that the Association were taking an active interest in propaganda amongst horse owners in regard to the Road Traffic Act, whilst Parliamentary agents had been appointed. Representations had been made in regard to the Road Traffic Act, and the Minister of Transport had been persuaded to accept two amendments in consequence. Suggestions concerning the Highway Code had also been made, the majority of which had been accepted by the Minister. Some 60 Corporation Bills had been scanned, in particular, those in which proposals were made to ban horses from grass margins of roads. A close watch had also been kept on the movement to bar the horse from certain London streets.

It was, therefore, evident, concluded the Hon. Secretary, that the National Horse Association were very active in seeking to protect the interests of the horse. (Applause.) He had no doubt that fuller information would be given them by Mr. Perryman in his report, which they would have later in the proceedings.

The President, on behalf of the meeting, expressed pleasure at the withdrawal by Colonel Young of his resignation.

On the proposition of Mr. R. A. Willett, seconded by Mr. W. Perryman, Major Soutar's resignation was accepted with regret.

Professor James Macqueen.—The President observed that, before they passed on to the next business, he desired to say that he was very pleased (as all present would be) to hear Dr. McCunn's report that Professor Macqueen was going on very well. (Hear, hear.) The first part of his operation was very successful and he was entering hospital for the second part immediately.

The meeting agreed that that night the Hon. Secretary should send Professor Macqueen a letter on behalf of the Fellows, wishing him "the best of luck." In making the proposition Dr. McCunn informed the Fellows that from the Royal Veterinary College a silver horse-shoe had been sent, with similar sentiments, to Professor Macqueen.

Morbid Specimens and Cases of Interest.

Mr. Herbert King said that he had one case to record which he thought would be of interest to the Fellows. A horse, six years old, heavy draught vanner type, was going through Blackwall Tunnel, when it slipped or stumbled to the ground. When brought to its feet it was exceedingly lame. An ambulance was sent for, the horse was taken to the stable, and he was asked to see it the next day. He found the animal in a good deal of pain and very lame, particularly in the off fore leg; when moved it appeared as if it were going to stumble on to its head. The elbow was dropped and there was radial paralysis. As the condition became rapidly worse, the horse was destroyed two days later. *Post-mortem* examination was made and revealed a condition which he had never seen before: fracture of the head and neck and shaft of the upper third of the first rib on each side.

Proceeding, Mr. King observed that he had in his hand a specimen which he had shown to the Society some time ago. It was a fractured first rib. The one on the other side was fractured first and the horse was in slings and treated for three months. It got perfectly sound and went to work again; but within a week it stumbled and broke the opposite rib. It never made a complete recovery; a false joint was formed, and the horse was destroyed.

Mr. H. C. P. King exhibited three fractured pedal bones, saying that the interesting point about the fractures in each case was that they were caused by the animals' coronets being run over by heavy lorries with rubber tyres, and there was no evidence of any external injury—not even was there any hair removed.

Captain R. J. Stow enquired if, in the case where the horse broke two ribs at once (one on either side) the fractures took place high up or low down on the bones.

Mr. Herbert King replied that they took place high up on the bones: the head and the neck of both ribs were so crushed that he could not get them together, or he would have brought them to show the Society.

In reply to the Hon. Secretary, Mr. King observed that the radial paralysis was not total, being confined to the off-side.

Professor G. H. Wooldridge thought that it was extraordinary that the subject of Mr. King's case should have been able to stand on the fore limbs at all. Had the animal been injured in one rib only, the probability was that it would have shown acute lameness of the fore limb on the injured side.

He thought that the other specimens (shown by Mr. Cyril King) were of greater importance to them as practitioners, in this sense: that he thought that most of them would have believed it to be impossible for an injury of that kind to have occurred from a wheel of a heavy lorry going over the foot without any external injury being evident.

The cases gained in importance from the possibility of litigation, as the absence of external lesions might suggest some explanation other than that the foot had been run over.

Professor J. G. Wright enquired of Mr. Herbert King if it was his experience that in rib fractures the top of the bone was most commonly involved, occurring immediately beneath the articular surface, or did they break, say, two inches from the sternum?

Mr. H. King replied that in the cases he had seen the fractures were generally in the higher position, and were probably due to muscular tension.

Professor J. McCunn said that they would all agree that the case under notice was a common fracture of the rib; it was one which took the form of an articular epiphyseal fracture. At the point of union of the head of the rib with the shaft, the bony structures were so deeply buried under muscle that fracture could never be due to direct violence, and he agreed with Mr. King that it was always a consequence of some extraordinary muscular effort at the attachment of the scalenus muscle. When a horse slipped up, to straighten his neck again he had to use that muscle, which was very powerful, and if there was any weakness in the first rib he would say it was almost certain to give way.

The subject of the case was a six-year-old horse, *i.e.*, it was mature and, if normal, it should have completely ossified epiphyses. It might be, however, that this was a horse in which there was delayed maturity, and that in it the upper end of the first rib and the shaft were not firmly ossified; hence the fracture, or the giving of the epiphyseal union.

The President expressed the view that both the specimens shown were unusually interesting and well worth noting in regard to the possible importance of litigation in connection with such cases, concerning which they might be asked to give opinion.

Nominations and Elections.—The following gentlemen were nominated as Fellows of the Society: Mr. C. A. P. Buckner (Brixton Hill), Major W. B. Howe, R.A.V.C., Major R. A. Stalker, R.A.V.C., and Mr. G. A. Tomlin (Hasketon, near Woodbridge). Election as a Fellow was unanimously made of Major W. Denington (St. Albans).

Presentation to Mr. E. L. Stroud.—The President observed that he would like to remind them that the subscription list was still open for the testimonial to their ex-Treasurer, Mr. Lionel Stroud. He felt that they owed a deep debt of gratitude to Mr. Stroud for the work he had done on their behalf for so many years (hear, hear), and, although doubtless all present had subscribed, he trusted they would neglect no opportunity of pressing any Fellows who had not done so to remedy the omission immediately. Professor McCunn was the Treasurer of the Fund, and would acknowledge all subscriptions.

Report of Delegate to the National Horse Association.

Mr. W. Perryman now presented his report in his capacity as the Society's delegate to the National Horse Association of Great Britain, in the following terms:

"In presenting this report to the Central Veterinary Society relative to the doings of the National Horse Association, it is not my intention to give a detailed account of all the proceedings, but as far as possible to summarise the work and give an idea of work achieved and the activities of the various committees that are being carried on. Reports of the various meetings have been regularly published in the *Veterinary Record*, therefore you should all be conversant with the work.

"Since the Annual General Meeting on April 2nd, 1930, Council and Committee meetings have been held in June, October, December, 1930, and February, 1931, at all of which I have been present. The work is now being carried over a vast number of subjects, all having the object of emphasising the importance and utility of the horse, and 'to further the welfare of the horse, and the interest of horse-owners and breeders.' The veterinary profession is directly interested, and should do all that is possible to further the work.

"To show that the activities of the National Horse Association were being largely circulated in the Press, it was reported that 26 papers had printed extracts of the relative costs of transport (written by Sir John Moore), 53 had given accounts of the award of the Bravery Medal and 38 had commented on the Slippery Road Report.

"The chief items I would enumerate, that have been dealt with, are slippery roads, publicity, shoeing medals, bravery medals, Parliamentary activities. The Slippery Roads Committee has done great work in all parts of the country, and it is no doubt due to their efforts that many roads have a much better surface, of a less slippery character than formerly, a fact which is greatly appreciated by motorists as well as horse owners. This improvement can be recognised by anyone travelling over roads that have been newly-made or re-laid. It will take some time before all roads can be treated so as to create a safer surface. One source of satisfaction is that the Minister of Transport and surveyors generally, are willing to listen to suggestions made by the Committee. It is not generally known that a complaint regarding the slippery character of any particular road or district, sent to the National Horse Association. is quickly investigated and representation as to suggested improvement is made to the proper authority. To illustrate this, a letter received from Lord Mildmay of Flete stated: 'Very great benefit had resulted to farmers in South Devon and to all who ride with hounds from the very successful efforts of Mr. Cecil G. Argles and the Slippery Road Committee to induce local authorities to treat our roads with larger grit.'

"The Publicity Committee have issued a large amount of literature to firms and veterinary surgeons and 40 agricultural colleges—notably, the pamphlet by Sir John Moore on 'The Horse and his Economic Usage.'

"Medals for shoeing—at agricultural shows—were given, also bravery medals, for special acts of gallantry in saving or attempting to save the life of horses.

"Parliamentary activities: The Exportation of Horses Bill was fully discussed. The Roads Traffic Bill and other Bills before the House are being carefully watched by Mr. Nigel Colman, M.P. (who is also on the Council of the National Horse Association), and where anything relating to the horse, and which might eventually react to the detriment of the horse-owner, was being carefully investigated. To the Roads Traffic Bill a series of amendments had been submitted which embraced such items as grass verges for the use of riders, taxation on motor horse boxes and the restriction of certain streets for horse traffic.

"It was considered desirable that a Parliamentary Committee should be set up and the appointment of a Parliamentary agent made. All proposed legislation as affecting horses would be studied and report made to the Association. This was agreed upon, and is to come into force at once.

"I wish to emphasise that much work has been done voluntarily, but, at the same time, to point out that expenses must be incurred. The National Horse Association urgently require new members and funds to carry out successfully the work that they are doing.

"There are now ten veterinary societies as members of the Association, and I think it should be urged that a

Midland Counties Division.*

Annual Meeting and Dinner.

The annual meeting of the Midland Counties' Division, N.V.M.A., was held at the Grand Hotel, Birmingham, on Friday, February 20th, with the President, Mr. H. Tudor Hughes, in the chair.

Nomination.—Mr. F. Chambers nominated Mr. Heathcote, of Bridgnorth, for membership of the Division.

Elections.—Four nominations at the previous meeting were now accepted in full membership, namely, those of Mr. R. P. Parsonage, Shrewsbury; Mr. W. R. Kerr, Harper Adams College; Mr. J. Cane, Wrexham; and Mr. R. E. S. Tuckey, Whitchurch.

Treasurer's Report.—The Treasurer (Mr. W. H. Brooke) presented his financial statement, which had been duly audited. This showed a balance in the bank of £66, but in recent years the income had not been sufficient to meet the expenditure, even after allowing for the payment of subscriptions in arrears.

Some discussion ensued as to how this position should be met; and the Treasurer said that if the annual subscription were increased from ten shillings to half-a-guinea it would suffice.

The meeting agreed to this in principle, but decided that it could only be done by an alteration of the rules, which would require notice of motion.

The accounts were passed on the understanding that the question of increasing the annual subscription were raised at a future meeting.

Resignations.—The Hon. Secretary reported that two members of the Association had tendered their resignation —Mr. G. H. Barber, of Brewood, who had left the district, and Mr. A. Crofts, of Bedford, who found himself unable to attend the meetings.

Both resignations were ordered to be accepted, with regret.

Royal Sanitary Institute.—The Hon. Secretary read a letter rom the Royal Sanitary Institute inviting the Division to be represented, as usual, at the next annual Congress to be held at Glasgow, in July. He moved that the President, for the time being, or his nominee, be appointed a delegate.

This was agreed to.

Obituary.—The Hon. Secretary referred to the death of Mr. J. G. Parr, of Leicester, an old and esteemed member of the Division, and he invited the authority of the meeting to forward a letter of sympathy to the family.

The President said they would all wish that this should be done, and the Hon. Secretary was requested to act accordingly.

Next Meeting.—A recommendation of the Council that the next quarterly meeting of the Association be held at Kidderminster, and that Mr. Frank Chambers be asked to read a paper on some topic of veterinary interest, was accepted.

Election of Officers.

The Council also submitted recommendations regarding the election of officers for the ensuing year, and these were also accepted. They were as follows:—

President: Mr. J. W. Conchie.

Vice-presidents: Messrs. H. Tudor Hughes, F. Chambers and H. W. Dawes

Hon. Treasurer: Mr. W. H. Brooke.

Hon. Secretary: Mr. H. J. Dawes.

Auditors: Messrs. F. L. Gooch, W. F. Aston and S M. Woodward.

Council: Messrs. A. Mackenzie, H. W. Steele-Bodger, B. DeVine, G. F. Banham, J. L. Cormack, J. R. Barker, and H. B. Hiles and the officers of the Division.

Veterinary Inspectors' Committee: The whole of the members of the Division who are veterinary inspectors.

Representatives on the Council of the National Veterinary Medical Association: Messrs. W. H. Brooke, B. DeVine, R Hughes, R. R. H. Over and H. J. Dawes.

Vote of Thanks.—Mr. W. F. Aston moved a vote of thanks to the officers of the Division for their services during the past year. He paid tribute to the excellent manner in which Mr. Hughes had discharged his presidential duties, and also to the work done by the Secretary and Treasurer.

Mr. H. W. Steele-Bodger, in seconding, said they were all agreed that they had had a real live president in Mr. Tudor Hughes.

* Received for publication March 12th, 1931.

greater number become affiliated to help a cause in which we are all so closely interested."

Mr. Perryman concluded by adding that, as the Fellows would have noted from the extracts from the report of the Parliamentary Committee read by the Hon. Secretary, the Association were giving a very close scrutiny to all Bills relative to anything that concerned the horse. All the facts to which he had referred were given in full in the report. The appointment of Parliamentary agents would ensure that, so far as legislation was concerned, all possible steps would be taken to safeguard the interests of horse owners. He would have said more, but if they had read their *Veterinary Record*, they would be aware of most of what he would have been able to tell them.

The President said that they were very much indebted to Mr. Perryman for his comprehensive report, and to him, he was sure they would agree, their hearty thanks were accorded. (Hear, hear.)

Paper.—The President now called upon Mr. R. A. Willett, M.R.C.V.S., to read his paper: "Some Problems of the Veterinarian." The paper was followed with great interest, and the many important questions raised therein were subsequently discussed with zest. [Mr. Willett's paper and a report of the ensuing discussion appear earlier in this issue of the *Record*.—Ed.]

Votes of Thanks.—At the conclusion of the discussion, the President said that he was sure he was voicing their views in proposing a very hearty vote of thanks to Mr. Willett for bringing that very interesting paper before them. (Hear, hear.) The paper had raised a good many questions which had not been brought forward and discussed so fully before.

Mr. Perryman seconded the proposition, which was carried with acclamation. Votes of thanks to those who had brought forward specimens and recounted cases of interest, and to the President for his conduct of the meeting, terminated the proceedings.

J. F. MacDonald, *Hon. Secretary.*

The motion was carried by acclamation, and the retiring PRESIDENT, in reply, said that whatever success he had achieved was due in part to the support he had received from the members generally, and especially to the energy and enthusiasm displayed by their Hon. Secretary, Mr. Dawes. It was Mr. Dawes, he added, who kept the flag flying.

Subscriptions.—The Treasurer was authorised to renew the subscription of one guinea to the National Horse Association, and also the annual subscription of five guineas and the special donation of five pounds to the Royal Veterinary Benevolent Fund.

A Message of Sympathy.—On the motion of Mr. ASTON, seconded by the PRESIDENT, it was resolved to send a letter to Mr. T. D. M. Martin, sympathising with him in his illness, and wishing him a speedy recovery.

The Annual Dinner.

The annual dinner was held later in the evening. The President and Mrs. Tudor Hughes received the guests, who included the following: Mr. and Mrs. H. J. Dawes, Mr. H. W. Dawes and Miss Dawes, Mr. and Mrs. George Smith, Mr. C. O. Langley, Mr. G. W. Dunkin, Mr. and Mrs. J. W. Conchie, Lieut.-Colonel P. J. Simpson, Mr. G. S. Lawrence, Mr. and Mrs. W. H. Brooke, Professor Gamgee, Alderman Lucas, Mr. H. Burrow, Dr. T. C. Graves, Mr. F. L. Gooch, Mr. and Mrs. Brennan DeVine, Mr. and Mrs. W. F. Aston, Mr. W. Trigger, Mr. G. L. Banham, Mr. and Mrs. F. Chambers, Mr. and Mrs. C. G. Allen, Mr. and Mrs. and Miss A. B. Forsyth, Mr. J. H. Hughes and friends, Mr. L. W. Heelis, Mr. and Mrs. J. L. Cormack, Mr. A. B. Fewings, the Misses Woodward, Mr. and Mrs. H. W. Steele-Bodger, Mr. and Mrs. Palmer, Mr. and Mrs. J. R. Barker and Miss Barker, and Mr. and Mrs. H. W. Griffiths.

Apologies were read from the following: Mr. M. Tailby, the Lord Mayor of Birmingham, Sir John M'Fadyean, Sir Gilbert Barling, Professor Macqueen, Dr. Seymour Barling, Mr. H. A. Miles, Professor F. Hobday, Mr. L. C. Tipper, Dr. Rowlands, Sir Charles Robertson, Messrs. T. J. Burchnall, E. Hall, R. Hughes, A. Mackenzie, G. P. Male, W. T. Olver, H. B. Hiles, H. S. Cockburn, W. E. Ison, H. C. Lowe, G. Brain, J. L. Brain, J. R. Carless, P. Abson, T. H. Hobson, O. V. Gunning, J. Robertson, E. Franklin, Professor Basil Buxton, Messrs. T. C. Clifford, W. Grasby, James Martin, T. O. L. Martin, etc.

Mr. Tudor Hughes was in the chair, and, after an admirable repast, he proposed the toast of "The King."

Professor GAMGEE followed with "The Royal College of Veterinary Surgeons." He said the Royal College enjoyed complete control over the veterinary profession, which had but one portal of admission. The medical profession, on the other hand, had many doors through which entrance could be effected—some very difficult and some apparently easy. He envied veterinary surgeons their one portal system, and advised them to stick to it, whatever else they might surrender. By such means they avoided confusion and established a uniformity which was greatly to be admired. He was afraid the man in the street did not realise how much he owed to the Royal College of Veterinary Surgeons. It ensured him a pure milk supply and safeguarded his health in many other ways which were taken too much for granted. The eradication of tuberculosis, especially in children, was being accomplished largely by the aid of veterinary science. He referred to the recent gift of £50,000 to the Royal College of Surgeons for research work in which the larger animals were to be used. That was the first step towards making the Institute at which this work was to be carried on a research institute for both professions, instead of only one. The union of the two professions in one great pathological institute would come some day, if not in his life-time, because veterinary pathology and human pathology was the same science.

The PRESIDENT, in the unavoidable absence of Professor Basil Buxton, replied to the toast, and thanked Professor Gamgee for his complimentary references to the veterinary profession. Although he was not a veterinary surgeon himself, Professor Gamgee's father and grandfather were, whilst it was to his zeal that they were indebted for the series of International Veterinary Congresses which reached their zenith at last year's gathering in London. The proposer of the toast had given them a word of advice which he hoped they would take to heart, and oppose any attempt from whatever quarter to deprive the veterinary profession of its present one-portal system. It guaranteed uniformity, and ensured one standard of excellence in the schools. It also provided for centralised control, which was another important matter. They were indebted to members of the Council for giving up so much of their time to the work of the College, and he would like specially to mention the services rendered to the profession by Dr. Bullock, the second edition of whose "Handbook for Veterinary Surgeons" had just appeared. It ought to be on every practitioner's book-shelf, for it would be found a safe guide to their privileges and to their conduct generally.

Mr. J. L. CORMACK, in a felicitous speech, proposed "The Visitors," extending to them a hearty welcome, and he coupled with the toast the names of Alderman Lucas, an old member of the Health Committee of the Birmingham Corporation, and Mr. G. S. Lawrence, manager of the Birmingham Co-operative Society's Dairy Department, who earlier in the year, invited the Division to inspect his wonderful plant and entertained the members to tea.

Alderman LUCAS, in reply, said he was recently a fellow visitor at Moscow with Professor Hobday, and they saw what was being done in Russia in the matter of veterinary progress. He would like to see more done in this country for veterinary science, and when he remembered the fine buildings in foreign lands he blushed for this country, which had so long neglected the Royal Veterinary College at Camden Town. He was proud to have had a hand in the appointment of Mr. Brennan DeVine as head of the Veterinary Department of the Birmingham Corporation. Mr. DeVine, he added, was a credit to his profession, as he was a credit to Birmingham.

Mr. LAWRENCE said that being responsible for the distribution of 70,000 gallons of milk per week in the city of Birmingham, they would understand how obligated he was to the veterinary profession. He was in daily contact with Mr. DeVine or members of his staff, in their common desire to secure a pure milk supply, and he paid a warm tribute to the high ability and unfailing courtesy which they at all times displayed.

Dr. T. C. Graves next proposed "The National Veterinary Medical Association of Great Britain and Ireland." He said it was a pleasure to revive the happy memories of years ago when he and their President of that evening were boys together. Mr. Dawes was his examiner 25 years ago, and turned him loose—" warranted, etc.," but whilst he held him in awe in those days, he now looked upon him with admiration and respect. The National Association, with which Mr. Dawes was so closely associated, was doing splendid work, but he thought it might very usefully take up another duty—the preparation of a history of veterinary medicine. He was afraid the lay public failed to realise the importance of veterinary medicine; not the least important chapter in such a volume would be the work of Pasteur, whose discoveries relating to modern surgery and modern medicine were originally made in the veterinary sphere. The British public knew nothing of the horrors of hydrophobia, and they had to thank Pasteur for that happy position. Contact with the animal world was of great value, especially in relation to agriculture, and that was one of the main interests of the National Veterinary Medical Association.

Lieut.-Colonel P. J. Simpson acknowledged the toast. He referred with some measure of regret to the circumstances which had placed him in the position of acting president of the National Association, and said they all hoped to see Professor Macqueen sufficiently restored to health to be able to undertake the duties for which he was so admirably fitted. The Association was moving from strength to strength, and was the real watch-dog of the profession. It was not the desire of the Association to usurp the functions of the Royal College of Veterinary Surgeons, even if such a thing were possible, but rather to supplement its work in every possible way. The Association had its critics and as long as criticism was helpful it was always welcomed, but much of the work had to be done behind closed doors. When delicate negotiations between the Government or local public bodies were in progress it was not prudent to discuss them in public, and the Association might possibly be accused of doing nothing. He could assure them, however, that the Association was watching the interests of the profession at all times, and was doing a good deal of work of which nobody ever heard. The *Record* also came in for a good deal of criticism, but they must all agree that their journal was steadily improving. It was suggested that the Editorial Committee should be superseded by a paid editor, but unless the paid editor was supported by the profession he could not do more than was already being accomplished. He had heard it said that they were not being sufficiently catered for in the matter of clinical cases, but that was the fault of veterinary surgeons themselves. Even a paid editor could not sit down and write clinical articles.

Referring to the forthcoming Congress at Norwich, Colonel Simpson said he hoped as many as possible would make a point of being present. From what he had heard the Eastern Counties were doing their best to make the occasion a memorable one, and it was up to everyone to help them to that end.

Major G. W. Dunkin gave the toast of " The Midland Counties Veterinary Medical Association," and referred to the wonderful work it had done during the 65 years of its existence. That had only been possible through the loyalty and enthusiasm of the members and more particularly the officers of the Association. In this latter connection he mentioned Mr. H. J. Dawes, who had been the honorary secretary for forty years. When anyone spoke of the Midland Division they had Mr. Dawes in mind, for he had brought it up to its present strength and he kept it alive. No provincial association could boast a bigger list of eminent men among its members than the Midland, and he was not surprised to learn that it was the strongest in the country in point of members. He congratulated his old friend and colleague, Mr. Tudor Hughes, upon the completion of a happy and successful year as President, and predicted that under its present able management the Midland would long retain its present pre-eminent position.

The President, in reply, said it had been a proud privilege for him to occupy the chair of so important a body as the Midland Veterinary Association. His year of office had been marked by a series of successful meetings, at which the attendance had been invariably good, and the subjects for discussion both interesting and instructive. That tended to show that the Midland was a live Association, and none could be better officered. He wished to take that opportunity of thanking the members for the way in which they had rallied round him, and especially their Secretary, Mr. Dawes, who had done all in his power to make the wheels run smoothly and well.

The concluding toast was that of " The Ladies," proposed by Mr. H. Burrow, and gracefully acknowledged by Mrs. Tudor Hughes.

An excellent musical programme added to the enjoyment of the evening, the artists being Miss Emilie Waldron, Mr. John Leak, Mr. Edgar Millward and Mr. Gordon Howard.

H. J. Dawes, *Hon. Secretary.*

Yorkshire Division.

Social Meeting at Leeds.

This Division held a very successful function at the Guildford Hotel, Leeds, on Friday, March 13th, when a company numbering 112 sat down to dinner under the chairmanship of the President, Mr. George E. Bowman.

Mr. J. R. Rider, Darlington (Secretary of the North of England Division) and Mrs. Rider, and Mr. W. Tweed (Secretary, North Midland Division) and Mrs. Tweed were present as guests of the Division, and others at the president's table were Colonel and Mrs. Bowes and Miss Bowes, Mr. and Mrs. H. M. Holland, Mr. and Mrs. S. B. Vine and Mr. D. S. Rabagliati.

In view of the dance which was to follow, speech-making at the dinner was reduced to a minimum. After " The King," Mr. F. C. Scott proposed the health of the President, alluding to his 50 years of membership in the Society and expressing the pleasure it gave to see him to be present and looking so well. This toast was enthusiastically received with musical honours.

In returning thanks, Mr. Bowman extended a hearty welcome to the many guests and friends who were present and hoped they would all enjoy a pleasant evening. Mr. John Gaunt expressed appreciation of the efforts of the

Royal Veterinary College.

Carnival Prize Distribution.

Approximately a fortnight after the triumphant event which called it forth to the aid of the charitable veterinary activities of the Royal Veterinary College, the spirit of carnival made its reappearance in the forbidding lecture theatre (of all places) on Wednesday evening of last week, when student hilarity and enthusiasm communicated itself to senior and normally grave participants in what, under more formal circumstances, would have degenerated into a "ceremony." But if jocularity was predominant in this celebration behind the scenes, as it were, of the success of the great veterinary hospital benefit performance which had been enacted in the streets of North London, the weight of the platform and the underlying seriousness of its observations, left no doubt not only of the value of the achievement, but of the stern necessity dictating this and every other measure designed to relieve a menacing financial situation.

The programme included the exhibition of an admirable film of the carnival procession, in the course of which the operator, Mr. Southern, had secured some singularly effective special "shots," to which the students and their friends gave vociferous recognition. It is a picture which, by multiplying witnesses of the processional presentation of the activities of the College, should bring home to a great number of potential supporters not only the magnitude of the effort being made to maintain the College, and typified by the show, but the essential nature of its work and the clamant urgency of its needs.

Principal Hobday, in introducing Lieut.-Colonel Percy Laurie, D.S.O., Assistant Commissioner, Metropolitan Police, who was to distribute the prizes, described the occasion as the climax performance of the Carnival, which constituted their greatest propaganda effort thus far on behalf of the re-building endowment and equipment fund of the College. All were proud of the fact that it had been essentially a students' effort, and there could be no question that by no other means could the flow of subscriptions be so effectively stimulated.

They were deeply indebted to Colonel Laurie for his kindness in coming to present the prizes. He and they had in common the love of a good horse—no one who was familiar with the splendid animals ridden by the men under Colonel Laurie's command could doubt that for a moment. (Hear, hear.)

The Principal concluded by referring in glowing terms to the splendid efforts to make the Carnival the undoubted success it had been which had been made by the Hon. Organiser, Mr. Raymond Holmes; the Assistant Hon. Organiser, Mr. Sam Poles, and the President of the Students' Union, Mr. G. S. Peyton.

Later in the evening these gentlemen were, in recognition of their services in this connection, made the recipients of suitably-inscribed cigarette cases, bearing the College crest, whilst for their splendid work, Mrs. Acatos and Miss King (Principal Hobday's Secretary) were asked to accept a case of silver spoons and an easy chair, respectively.

Lieut.-Colonel Laurie expressed his admiration of the work of the organisers of the Carnival and congratulated the prize-winners. It really was a splendid show—he was one of the judges, and he knew—yet the primary object of the entrants was not to win a prize but to contribute in some measure, however small, towards the effort that was being made to help the institution. (Cheers.) It was a scandal that a great College like that should be allowed to fall into its present state, and that it should not receive a greater measure of State aid. Everyone should do all in his or her power to make the College worthy of this great sporting country.

It was a great relief and satisfaction to him to know that if anything went wrong with the Metropolitan Police horses he could always rely on the Royal Veterinary College to get them back on the streets again in the shortest possible time. (Hear, hear.)

He felt that that Carnival was notable, not only for the splendid sum of money—nearly £700—collected on the streets, but for the wonderful propaganda work which it had accomplished. (Cheers.)

Colonel Laurie having distributed the prizes, Sir John Moore proposed a vote of thanks to the organisers and to the members of the Carnival Committee. As Principal Hobday had said, it was quite true that that was a students' effort and, as he (Sir John) had seen it from beginning to end, he knew that it was an extraordinarily successful and well-organised festival and he trusted that it would be the precursor of other carnivals (hear, hear), because they must get money for the Re-building Fund of the College. As a Governor of the College, he knew exactly the position of things; it was most essential that it should be put on a proper basis as a teaching institution and as a hospital.

It was a very pleasant task for him to act as a judge, and he thought they owed a great debt of gratitude to the organisers and Carnival Committee. One could realise the amount of hard work that must have been put in in preparation, and which had taken the best part of two months. (Cheers.)

Sir Walter Gilbey, who seconded the vote of thanks, said that one of the greatest joys of his life was to be amongst people who were fond of animals and of the horse in particular, and he had the greatest admiration for and interest in the work accomplished by that great institution. The enthusiasm and loyalty shown in connection with that Carnival redounded to the credit of the organisers and Committee, and the general body of students who supported the effort, and he thought that the outside world should know of the backbone that there was in the students of that College, for he was confident that it would result in a general loosening of purse strings.

The Royal Veterinary College was a necessity to the country, and it astonished him in a measure beyond the power of words to express that the Government should hesitate for one moment to come forward and give all that was required to put the institution in a proper financial

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Committee (The President, Mr. Scott, Mr. J. A. Dixon, Mr. W. Crawford and the Secretary) who were responsible for the arrangements of the function.

The dance which followed was carried on with zest by the company, who also enjoyed a first-class cabaret performance which was staged mid-way through.

S. Sharp, *Hon. Secretary.*

position. It was a profound disgrace to our country. (Hear, hear.) The Ministry of Agriculture and the Government professed to want to do so much for agriculture, and surely one of the greatest things they could do for agriculture was to provide at least the paltry sum that was asked for to place that College in proper order. (Cheers.)

We should become a tenth-rate Power if we did not keep our studs, flocks and herds in such a condition as it was the business of the veterinary surgeon to maintain. He could not imagine any Government allowing such an institution as that to go by the board; he would be ashamed to live in a country that permitted such a thing to happen. (Cheers.) He felt what he was speaking about very deeply indeed, and if he could be of any use to that institution or to any of his hearers individually he should always be at their service. (Cheers.)

A vote of thanks to the judges, donors of prizes, the students, and all who had participated actively in the Carnival was proposed by Professor James McCunn, whose suggestion that a special meed of praise was due to the students for the orderly way in which they conducted the festival, met with wild endorsement from the back benches.

Professor J. G. Wright seconded, paying particular tribute to the fine band of the Metropolitan Police which headed the procession, the collectors (especially those not associated with the College), the fine work put in by the Indian students (as the prize list testified), the "monkey on the pillar-box at Golders Green" and the hind legs of the donkey "whose view of the Carnival was probably a restricted one."

Professor G. H. Wooldridge having voiced the indebtedness of all concerned to Colonel Laurie for his part in the proceedings, Mr. Charles Pond induced a return to applause of the more riotous type by his rendering of "Evans's Dog Hospital"—his own tribute to the financially successful exponent of the doctrine of diet-reduction as applied to boarded dogs.

Following is the list of prize-winners:—

Class A.—*Best-kept Horses in Single-horse Vehicles.*—1st. Geo. J. Cockerell; 2nd. Carter Paterson; 3rd. Thomas Tilling.

Class B.—*Best-kept Horses in Pair-Horse Vehicles.*—1st. Messrs. Watneys; 2nd. Carter Paterson; 3rd. L.M.S. (Tableau); Extra. L.M.S. (Tableau).

Class C.—*Best-kept Four-horse Team.*—1st. Bertram Mills; 2nd. Schweppes (coach); 3rd. Express Dairies; Extra. L. C. Lamerton, Esq.

Class D.—*Best-decorated Single-horse Vans.*—1st. Vicarage Farm Dairy; 2nd. United Dairies; 3rd. Clay Cross. (Driven by "Dick Turpin."); Extra. Clay Cross. (Driven by "Widow Twankey.")

Class E.—*Best-decorated Pair-horse Van.*—1st. Class A (Tableau); 2nd. Class C (Tableau); 3rd. Class B. (Tableau); Extra. R.V.C. (Women's Tableau, 18th century); Extra. R.V.C. (Women's Tableau, modern); Extra. Worshipful Company of Farriers.

Class F.—*Best-decorated Four-horse Vehicles.*—1st. L. C. Lamerton, Esq.; 2nd. Express Dairies; 3rd. Express Dairies.

Class G.—*Drivers of Horses in Best Fancy Costumes.*—1st. "Widow Twankey," of Clay Cross; 2nd. Driver of Class A Tableau; 3rd. Driver for L. C. Lamerton, Esq.; Extra. Gas, Light and Coke; Extra. Vicarage Farm Dairy.

Class H.—*Best-decorated Motor Vans under 1 Ton.*—1st. Alfred Rimmell; 2nd. Tailwaggers' Club; 3rd. Spratts Patent, Ltd.; Extra. Ewarts & Son, Ltd.

Class I.—*Best-decorated Motor Vans over 1 Ton.*—1st. Messrs. Hammetts; 2nd. J. Lyons and Co., Ltd.; 3rd. Clark & Sons (1929), Ltd.; Extra. West Ham Stadium.

Class J.—*Best-decorated Private Cars.*—1st. Mr. Lamb (R.V.C.); 2nd. Mr. R. B. Singh (R.V.C.); 3rd. Mr. Greenwood (R.V.C.); Extra. Mr. Iorns.

Class K.—*Best-kept Dogs.*—1st. Rainham Junior; 2nd. "Just Jim."; 3rd. "Miss Rainham."

Class L.—*Gentlemen's Best Fancy Costumes.*—1st. Bro. Gill; 2nd. Bro. F. A. Caulfield; 3rd. Bro. H. Jaquest; 4th. Mr. G. S. Bushall; 5th. Mr. T. Stead.

Class M.—*Ladies' Best Fancy Costumes.*—1st. Betty Jones and Wendy; 2nd. Miss F. Lincoln; 3rd. Mme. Imhof; 4th. Mrs. Berry; 5th. Sister Holsgrove.

Class N.—*Gentlemen's Best Fancy Costumes.*—1st. Mr. N. H. Brooksbank; 2nd. Mr. M. Malik; 3rd. Mr. Khan; 4th. Mr. F. P. Rickard; 5th. Mr. R. Singh; 6th. Mr. F. Francis; 7th. Mr. G. B. Singh; 8th. Mr. B. Singh; 9th. Mr. E. White; 10th. Mr. G. P. West.

Class O.—*Ladies' Best Fancy Costumes (Students).*—1st. Miss E. Hancock (Art Student); 2nd. Miss M. Levi (Old-fashioned lady); 3rd. Miss G. Ford (Donkey); Extra. Miss B. Murray (Mexican).

Fancy Dress Prizes.

(Held on March 6th at the Athenæum.)

Ladies.—1st. Miss Atwill; 2nd. Mrs. Hicks; 3rd. Miss Roberts; 4th. Miss Lane.

Gentlemen.—1st. Mr. R. B. Singh; 2nd. Mr. E. B. Singh; 3rd. Mr. Lunn.

Consolation Prizes.—Mr. Hicks; Mr. G. Parker; Mr. H. Pool; Mr. B. Singh; Mr. Dover.

Prize Winners for the Highest Collections.

	£	s.	d.
1st. Miss E. M. Jacques	7	6	7¼
2nd. Mr. P. G. Pande	6	14	11½
3rd. Mr. G. B. Singh	6	6	9½
4th. Mr. J. W. Leiper	5	18	6½
5th. Mr. Mehra	4	19	11½
6th. Miss E. H. Woodger	4	15	6½
7th. Mr. L. R. Morford	4	14	2
8th. Miss E. K. Finke	4	13	0
9th. Miss M. V. Levi	4	2	4
10th. Mr. D. Richardson	4	2	1¾

Rugby Football.

London and Edinburgh Draw.

The annual match between the Veterinary Colleges of London and Edinburgh was played at the Canal field at Craiglockhart last week.

The opening exchanges were vigorously contested, but not by any means could either side assume a really aggressive position. It was largely a forward game, but in the few handling movements, the home men showed the better touches, and following a spell of pressure, R. F. Hall, the scrum half, slipped through for a try, which Muir failed to convert. Subsequently London had more of the game, and for a time they endangered the Edinburgh line, Grant taking the eye with some good defending. More midfield play followed until the interval.

Half-time: R. (D.) V.C., 1 try (3 points); London Veterinary College, 0.

In the scrums on the restart, the visitors seemed to be putting in a bit extra, and they got quite a lot of the ball, only to find that the poor handling of their three-quarters threw away their chances. Play became scrappier and scrappier, few movements showing any cohesion.

The visitors were redoubling their efforts, and at last the ball reached the wing, where D. F. Smith pushed his way over for a try which G. A. Hudson failed to improve upon. On level terms, the struggle continued, the rain making matters worse than ever for the players, there being no further scoring.

A draw was quite a fair result to a game which was contested in a holiday spirit, not too much seriousness being shown by the participants. In the London side, R. Miller and F. A. R. Chipperfield did much solid work, the latter being very successful with his hooking, while behind the scrum the captain, E. B. Inch, was ever ready to initiate an attack, though not enjoying the best of success.

For the home side, whose defence was not so reliable as usual, I. A. Graham and T. B. L. Muir were the most noteworthy performers.

Result: R. (D.) V.C., 1 try (3 points); London Veterinary College, 1 try (3 points).

Royal (Dick) Veterinary College: A. M. Grant; A. Adamson, I. M'Laren, ——, W. E. Lancashire; I. A. Graham and R. F. Hall; T. B. L. Muir, J. Anderson, J. Jack, A. Adams, I. H. Chalmers, A. W. Chalmers, A. D. Laing, and J. Prentice.

London Veterinary College: G. S. Peyton; D. F. Smith, A. E. C. Foster, J. F. Ryan, and E. P. Rice; E. B. Inch and K. I. Barlow; R. Miller, F. A. R. Chipperfield, J. G. Speed, A. G. Baron, G. A. Hudson, F. T. Davidson, T. F. A. L. Princep, and G. H. Silcock.

Referee: W. Main Calderwood, United Colleges.

Lord Moynihan on Milk and Tuberculosis.

Lord Moynihan, who recently in the House of Lords attacked the country's milk supply, in an address to the Leeds Luncheon Club on Monday, said that the position was more grave than he had at first indicated. He had no quarrel with the farmer, except that the milk he produced was so often contaminated. In this country there were, roughly, 1,000,000 farms, and of those only 400 produced grade "A" tubercle-free milk. The remainder produced grade "A" milk, in which he had no confidence whatever. He regarded all milk as falling into two categories only, that which was free from tubercle and that which was not. There were only 152 licences in this country for the sale of certified milk, and only 188 for the sale of grade "A" tubercle-free milk.

At a minimum estimate 40 per cent. of the cows in this country suffered from tuberculosis. Of the cows slaughtered in London 33 per cent. were found to be affected with tubercle, and in Edinburgh the figure was 42 per cent. Not only so, but 31·5 per cent. of tuberculosis in children under the age of 15 and 57 per cent. of the cases of enlarged tuberculous glands had been proved to be due to the drinking of contaminated milk. Experiments proved that children who were given pasteurised milk had their weight increased, not by 3·85 lb., which was the normal increase in the period during which they were under observation, but by 6·98 lb., and their height increased by 2·64 in., instead of 1·84 in.

Medical men had never disputed that milk was the best of all natural foods. The people of this country did not drink nearly enough of it. We drank only half as much a head of the population as did the people of Canada, one-third as much as the Americans, and one-sixth as much as the people in the Scandinavian countries. But milk ought to be the pure unadulterated product of the cow, and it so seldom was. Had anyone ever seen a clean cow? Contamination was rife. The result was that milk produced, to a degree that few people outside the ranks of the medical profession realised, a number of diseases. It produced a form of tuberculosis, diseases of the intestines, of the glands, joints, and bones. In 1928 it produced in London an epidemic of 400 cases, in Northampton 95 cases, in Bedford 72 cases, and in the Roundhay district of Leeds 83 cases. One hundred people died every day from tuberculosis. Medical men desired that every one in the country should be able to have milk, provided that the supply was pure.

Later in the day, at their invitation, Lord Moynihan met the West Riding Farmers' Union in a private conference and debate.

In Parliament.

The following questions and answers were recorded in the House of Commons recently:—

Bovine Tuberculosis (Serum Treatment).

Mr. Hurd asked the Minister of Agriculture what tests are now progressing in England of the value of the serum treatment of bovine tuberculosis; and if, in the interests of the fresh milk industry, he will use his influence to expedite these tests?

Dr. Addison: I would refer the hon. Member to the reply which I gave on March 5th to a question by the hon. Baronet, the Member for Caithness and Sutherland (Sir A. Sinclair), of which I am sending him a copy. I have recently had under careful consideration the possibility of expediting this research, and can assure the hon. Member that any steps that may be practicable in this direction will be taken.

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Milk Supplies (Tuberculosis).

Mr. Longbottom asked the Minister of Health if he has considered a resolution of the Halifax County Borough Council requesting that, owing to the high incidence of tuberculosis among dairy cattle, he will amend the Milk and Dairies Acts of 1915 and 1926 so as to confer on local authorities the power to make compulsory the notification of all cattle arriving in their respective areas within 48 hours of arrival; and will he arrange to introduce legislation to meet this request?

Mr. Greenwood: I have received this resolution from the councils of several county boroughs, and will consider it in consultation with my right hon. Friend the Minister of Agriculture and Fisheries.

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Milk (Nutritional Value).

Brigadier-General Clifton Brown asked the Minister of Health whether he will arrange for a study to be made of the relative nutritional values of the different types of milk which are on sale, either by the Medical Research Council or by the committee which the Government have recently set up to study the nutrition of the nation; and whether the research experiments of the Dairy Research Institute at Shinfield in that direction will be carefully considered?

Mr. Greenwood: I will consider the hon. and gallant Member's suggestion.

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Condensed Skimmed Milk (Import).

Sir G. Bowyer asked the Minister of Agriculture whether his attention has been called to the recent increase in the importation of condensed skimmed milk; and what steps he is taking in this matter to help British farmers?

Dr. Addison: The quantity of condensed skimmed milk recorded as imported into the United Kingdom during 1930, was less than in 1929, and was also lower during the last six months of 1930 than in the corresponding period of 1929. In my opinion, the organisation of home producers is a necessary condition precedent to other action.

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Regulations (Oxford Street).

Sir R. Gower asked the Minister of Transport whether he is aware that the traffic congestion in Oxford Street, London, is materially contributed to by the number of half-empty omnibuses which traverse the street; and whether he will consider the advisability of exploring other methods of traffic control before restricting the use of horse transport in Oxford Street?

Mr. Herbert Morrison: It has not been found practicable under existing conditions to make any substantial reduction in the number of omnibuses in Oxford Street. The London Traffic Advisory Committee carefully considered in all its aspects the traffic problem presented by that street before advising me to make the Regulations of which notice was given in the *London Gazette* on 20th February last, and I do not think that any useful purpose would be served by reviewing the problem afresh. As the

hon. Member is probably aware, it is open to any person who may be concerned to make representations to me with regard to the proposed Regulations on or before 1st April next.

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Premium Bulls.

Mr. Turton asked the Minister of Agriculture if he will state how many premium bulls there are at the present date in England and Scotland, respectively; what proportion of the bulls in each country are premium bulls; and what sum is contributed by the State towards the provision of premium bulls?

Dr. Addison: The figures are as follow:—

	Number of Premium Bulls.	Total Number of Bulls on June 4th, 1930.	Percentage Proportion of Premium Bulls to Total.	Amount provided in Financial Year, 1930-31, for State grants in respect of Premium Bulls.
				£
England and Wales	1,543	82,816	1·9	20,900
Scotland	666*	17,147	3·9	8,700

Mr. Turton: Will the right hon. Gentleman consider the advisability of increasing the number of premium bulls to at least the number in Scotland?

Mr. Haycock: May I ask what is a premium bull?

Dr. Addison: It is an animal in respect of which a premium is paid.

Sir N. Gratton-Doyle: Has the right hon. Gentleman's Department succeeded in the elimination of the scrub bull?

* Excluding bulls supplied, on loan free of charge, to crofters grazing committees under the Scheme administered in the congested districts of Scotland. The number of such bulls on loan during 1930 was 279.

Performing Bears.

Mr. Freeman asked the Home Secretary whether his attention has been called to many recent accidents caused by captive bears; and whether he will consider the desirability of prohibiting the importation of performing bears into this country?

Mr. Clynes: I am not aware that there have been many accidents of this kind. I have seen a Press report of a recent case, and my attention was called to a similar incident some months ago, but I have not heard of any others. There is no power to take any action of the nature suggested.

Mr. Freeman: Is it not a fact that there was a fatal accident only last year, and that there was a very serious accident at Cardiff on Saturday?

Mr. Clynes: As I have said, all the knowledge I have on the matter is stated in my reply.

Mr. Charles Williams: Have any of these accidents happened in Dumbarton?

National Abattoir Scheme.

Early last year it was announced that a scheme was in preparation for erecting a National Abattoir at the mouth of the River Severn. It then met with a very cold reception, and as nothing further had been heard of the project the public came to the conclusion it had been abandoned. A company has, however, recently been registered under the title of British Trade Propaganda Corporation, Ltd., which is empowered under its articles to act as parent company for developing the scheme. An advisory committee of experts to advise the Board is being formed, and the English, Irish, and Scottish Farmers' Unions will be invited to nominate members thereon.

Arrangements, it is stated, have already been completed by which the services of foremost firms in the country have been retained for the various professional appointments in connection with the ultimate public issue, and negotiations are in hand with an Englishman who has held some of the most important positions in the meat trade in Chicago and South America, with a view to his becoming General Manager of the National Abattoir when it is established.

To overcome the objections of Scottish feeders to the original proposition on the score of expense for transporting cattle to the West of England, there is now some talk of building an abattoir somewhere on Clydeside.

The Company believe there will be an ample supply of stock right from the start, and by handling the meat through their own chain of retail shops they will be in a position to pay feeders better prices than are obtainable in the ordinary markets.

It will take at least six months to prepare the preliminary data, and both the Ministry of Agriculture and the Ministry of Agriculture of the Irish Free State, have offered to co-operate by supplying any statistical information at their disposal.—*Meat Trades Journal.*

Production of Encephalitis with Vaccinia Virus.

A. Eckstein (*Zeit. f. Hyg. u. Immunitats., January 15th*, 1931, p. 151) injected vaccine lymph, in doses of 0·00078 to 0·1 c.cm., by the suboccipital route into the spinal fluid of monkeys. After three days the monkeys became unduly quiet, and exhibited a certain stiffness in their movements. These symptoms were succeeded by spastic paralyses affecting the front or hind limbs; ocular paralyses were noticed in two animals. Later the animals adopted the semi-recumbent position, and were no longer able to reach for food, though they were able to swallow it if it was placed in their mouths. Respiration became increasingly difficult, and death occurred between the sixth and fifteenth days. Of the 17 animals inoculated, one showed no symptoms, and two others were killed after six and eight weeks respectively. Histological examination of the brain of the fatal cases showed the presence of a meningo-myelo-encephalitis. Two control monkeys were inoculated intraspinally, one with 3 c.cm. of saline and one with 0·1 c.cm. of heated vaccine lymph; both remained perfectly well. Three monkeys injected into the carotid artery with 0·1 to 0·5 c.cm. of fresh lymph developed no symptoms, though 14 days later they failed to react to the intracutaneous inoculation of vaccinia virus. Three additional monkeys were injected intraspinally with a mixed culture of the contaminating cocci and bacilli present in vaccine lymph; these monkeys likewise remained well. Though the author draws no definite conclusions about the etiology of post-vaccinal encephalitis in man, he considers that, taken in conjunction with the finding of vaccinia virus in the spinal fluid of three cases (Gildemeister, Eckstein, and H. and K. Herzberg), the production in monkeys of a similar meningo-myelo-encephalitis must be regarded as significant.—*British Medical Journal.*

Tuna and sardine oils were found to be as good as, or better than, cod-liver oil in vitamin D potency. Menhaden and salmon oils are also important potential sources of this vitamin. Salmon oil proved to be as potent in vitamin A as poorer grades of cod-liver oil. These results are important commercially because they point the way towards a potential source of vitamin-bearing fish oils for use in the poultry industry, which has already found it practical to make use of cod-liver oil and ultra-violet radiation as sources of vitamin D.—E. M. Nelson and J. R. Manning *Ind. Eng. Chem.*, Dec., 1930, 1361, Ex. *Pharm. Journ.*).

Draft regulations proposed by the International Labour Office Correspondence Committee on Industrial Hygiene for the measures to be taken against infection from anthrax in the hides and skins industry have been communicated to the Governments for their opinions and for a statement of the measures they would be prepared to take to give effect to these regulations.

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

March 28th.—North Midland Division, N.V.M.A. —Social evening at Sheffield.

March 30th.—Meeting of the Editorial Committee, N.V.M.A., 10 Gray's Inn Square, W.C.1, 4.30 p.m.

March 31st.—Meeting of the Scottish Branch, N.V.M.A., at Aberdeen.

April 1st.—Annual Fee of £1 1s. due to R.C.V.S. under Veterinary Surgeons Act, 1920.

April 2nd.—Meeting of the Central Division, N.V.M.A., at 10, Red Lion Square, W.C.1.

April 7th.—**N.V.M.A. Extraordinary General Meeting**, 10 Red Lion Square, W.C.1, 2.45 p.m.

N.V.M.A. Council Meeting, 10 Red Lion Square, W.C.1, 3 p.m.

N.V.M.A. Committee Meetings, 2 Verulam Buildings, Gray's Inn, W.C.1 :—Appointments, 10 a.m. ; Parliamentary, 10.30 a.m. ; Joint Meeting of Parliamentary and Veterinary Officers' and Public Health, 11 a.m. ; Veterinary Officers' and Public Health, 11.30 a.m. ; Organising, 12 noon.

April 8th.—R.C.V.S. Registration and other Committees. Victoria Veterinary Benevolent Fund Council.

April 9th.—R.C.V.S. Examination, Registration and Parliamentary Committees.

April 10th.—R.C.V.S. Library and Finance Committees. 2 p.m., **Council Meeting.**

May 8th.—Last day for nominations to Council R.C.V.S.

May 21st.—R.C.V.S. Voting Papers and Annual Report issued.

May 28th.—Last day for return of Voting Papers R.C.V.S. Council.

June 4th.—**R.C.V.S. Annual General Meeting.** Victoria Veterinary Benevolent Fund, Annual Meeting.

June 15th-20th.—D.V.S.M. Examinations.

July 2nd.—**R.C.V.S. Annual Dinner.**

Aug. 22nd-28th.—N.V.M.A. Congress at Norwich.

Personal.

Wills.—Adams, Mr. Andrew Sclanders, M.R.C.V.S. (55), of Dursley, Glos., managing director and chairman of Dursley Gas Company (net personalty, £13,265), £19,346.

Parr, Mr. John George, F.R.C.V.S., of 4, Clarendon Park, Road, Leicester, Chief Veterinary Inspector for the Leicestershire County Council, and at one time connected with the Quorn and Fernie Hunts (net personalty £10,308), £16,920.

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Appointment.—Mr. W. Tweed, M.R.C.V.S., D.V.S.M., has been appointed as Chief Veterinary Officer to the Sheffield City Council, at a salary of £700 a year.

Captain J. Gregg's Work for Ulster Dairy Herds.

At a luncheon in the Grand Central Hotel, Belfast, which was given on March 13th, in connection with the annual distribution of prizes awarded by the Central Milk Recording Society of Northern Ireland, the ceremony of presenting the cups was performed by Captain the Right Hon. Herbert Dixon, M.P., who said that the interest that was now taken in agriculture in the six counties was extraordinary, and that an enormous amount of the credit of getting that association together and bringing it to success belonged to his old friend, Captain Gregg.

The report of the judge, Mr. J. Johnstone, showed that there was an increase in the average milk yields of the best herds. This year the total points for the 20 best herds were 4,678·15, representing a difference in favour of this year by 226·38 points, or 11·31 points per cow, equal to an improvement of about 60 gallons per cow.

Foot-and-Mouth Disease.

The Ministry of Agriculture announced on Tuesday night that the existence of foot-and-mouth disease was confirmed on premises at Briercliffs, near Burnley, Lancashire.

The area subject to restriction under the Prohibition of Movement Order now in force is partly in the county of Lancashire and partly in the West Riding of Yorkshire.

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Only three outbreaks of foot-and-mouth disease occurred in Great Britain during the 12 months ended March 9th, 1931, against eight in 1930. The animals slaughtered were 128 cattle, 221 sheep, 347 pigs, and two goats. Compensation paid totalled £4,234.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication

The Editor does not hold himself responsible for the opinions of his correspondents.

Reorganisation of Professional Examinations, R.C.V.S.

To the Editor of The Veterinary Record.

Sir,—My excuse for troubling you is to be found on page 324 of this journal in the form of a letter from Dr. Tom Hare, asking for further light on the scheme approved by the Sub-Committee on Curriculum for the Reorganisation of Professional Examinations.

The Scheme was adapted from an outline which I had prepared, and the report states that my scheme, after slight verbal alterations, was approved and recommended for adoption. In my opinion the alteration was very far from slight. I had proposed that the examiners in any subject could refer a student without considering how he had fared in other subjects, so that a student could conceivably be referred in three subjects at the same time. This option was reduced by the Sub-Committee to a possible reference in one subject only. I think that this makes the proposed change too severe, lessening the student's chances as compared with those open to him at present. Had my proposal gone through intact I was going further to propose that the examiners in the different subjects of the same year should hold the oral examination at a given centre on different days. This would have had two advantages—there would have been no summing-up, and the nervous strain on examinees would have been lessened. The amendment restricting reference to one

subject made a summing-up necessary, so my further proposal was not put.

In reply to Dr. Hare's specific questions :—

(1) Disadvantages in existing regulations.

(*a*) *To Examiners.*—They are unable to maintain a definite standard, but in borderline cases must give and take, depending on the examinee's attainment in another subject.

(*b*) *To Examinees.*—Failure in one subject, by making them attend all three, prevents their concentrating fully on the weak subject, as they have again to do the special memory work on subjects already passed: if they fail in July they are required to attend opening lectures when what they need is revision of the gaps in their knowledge: if they then succeed in December they are penalised by beginning the next set of subjects in the middle of the teaching.

(*c*) *To the Schools.*—Teaching is seriously hampered by a batch of failures who have to be prepared for an examination in December when the main class does not sit till July. Failures in December are only required to attend one term before sitting again in July: this makes for a small enrolment (and income) in the Spring Term, and adds to the difficulty of inducing backward students to settle down to study.

(2) My proposals are supposed to remedy these disadvantages by allowing a more definite standard to be set in the different subjects; lessening the penalty on the student for slight inadequacy of knowledge, by giving him the summer to make up deficiencies in the separate subjects, and increasing the penalty for total inadequacy to a whole year, which is in fact the shortest time in which a real failure can be expected to round out the required study. The relief to the teaching staff is too obvious to need further elaboration; there is no more trouble with students beginning in the middle; subjects are taught in their proper order.

Yours faithfully,
A. W. Whitehouse, *Principal.*

Glasgow Veterinary College.
March 24th, 1931.

Specialisation and Research.

To the Editor of The Veterinary Record.

Sir,—The "editorial" in the *Veterinary Record* of March 14th gives the necessary stimulus and opportunity to bring forward for general discussion two problems which, in the near future, will doubtless receive a considerable amount of attention, particularly after the introduction of the five years' course. The problems referred to are specialisation and research. The younger members of the profession, probably consequent upon youthful enthusiasm, apparently desire the former, at any rate in colleges, but it is hardly likely that this specialisation will be carried out to any marked degree in the near future owing to a large number of difficulties, particularly that of expense. The problem of research, however, merits more urgent and general consideration.

The pendulum always swings to extremes and, speaking generally, things have now reached the pitch when the research worker and clinician live in different worlds, neither able to understand the other. With a few exceptions, the majority of research work at present proceeding falls into the category of pure science and, without belittling in any way the importance of this work, it is a recognised fact that it lacks immediate practical application.

These considerations naturally lead one to the belief that the introduction of a system of clinical applied research, to bridge over the gap between the pure scientist and clinician, is both desirable and necessary. It is felt that further observation and research on actual cases should be carried out by suitable persons, who as an essential part of their training have carried out sufficient clinical work to enable them to realise the difficulties encountered by the practitioner. The clinician, both in colleges and in practice, can do much in this connection, but by pressure of work and constant interruptions he is prevented from proceeding as far as desirable.

A scheme of such research might, with advantage and at relatively low cost, be commenced with the introduction of a small staff into the colleges for the purpose of working on the cases in the infirmaries.

The views of other members of the profession on this subject would be interesting and, it is hoped, lead to a solution of the problem.

Yours faithfully,
J. W. H. Holmes.

Camden Town, N.W.1.
March 23rd, 1931.

Anæsthesia and Ethics.

To the Editor of The Veterinary Record.

Sir,—Since the publication of the "Dubbing of Fowls" case is likely to spread beyond the bounds of veterinary literature, I think that the professional witnesses should be congratulated upon their almost unanimous stand against the performance of such unnecessary operations.

Unfortunately, Mr. G. C. Lancaster's letter, in a later number of the *Record,* rather spoils the effect. His remark, "Poultry keeping is a commercial undertaking, with very little sentiment attached to the birds" is quite true, but is no excuse for performing an operation that carries on an old-wives' tale of frost-bite and fertility.

I do not doubt that every veterinary surgeon, while castrating lambs and pigs has pitied the brutes, but shrugs his shoulders and mutters "commercial necessity." What a comfort to the animal and what a salve to know that his appreciation of pain must be less than that of the operator!

Surely the time has arrived for some section of the profession or some official professional body to lay down a limit beyond which they will refuse to go without the use of a local or general anæsthetic. The limit should undoubtedly be that beyond which we ourselves would be unwilling to be taken.

The veterinary profession alone holds the scales between excessive sentimentality towards animals, and their misuse in the interests of commerce. Unfortunately, many pockets will be touched on the one side and much frothy sentimentality will proceed from the other, before the scales are steady.

The ever-increasing policy of humane slaughter and the production of the Animal Anæsthetics Act are two very large straws which show the trend of the current, and with the current the profession must go. Enquiries are continually being made of the profession regarding the well-being of animals, and we must show very forcibly, and unanimously that the animal is our only concern.

Yours faithfully,
A. C. Shuttleworth, B.V.Sc., M.R.C.V.S.

Department of Veterinary Anatomy,
Liverpool University.
March 19th, 1931.

Treatment of Post-Parturient Dyspepsia.

To the Editor of The Veterinary Record.

Sir,—Will you kindly publish this letter in the *Record,* as there are practitioners who may wish to make use of the treatment this season, which is nearing the end.

Since reading the paper before the Lancashire Division a little over a year ago, the investigation into the disease post-parturient dyspepsia has been continued. It has been found that the radical treatment of the disease is to lessen the secretion of milk and that a cure is effected by milking the patient only once a day and only allowing hay and water. The period for milking once a day differs in patients, but, generally speaking, from one to three weeks may be taken as a guide. It is also necessary to keep to the diet of hay and water for several weeks. Should the

patient show disinclination to feed or any symptom suggestive of the trouble again, the treatment of milking only once a day should be repeated.

In the case found at the first visit to be more or less comatose, " inflation " of the udder and the subcutaneous administration of half-a-pound of medicinal glucose dissolved in nine pints of normal saline solution (or water) is the treatment adopted, the diet being only hay and water.

In the case exhibiting nervous symptoms or in the case which is " down," inflation is sufficient, with the diet of hay and water. Stress has been laid on the diet of hay and water, as cereals, as well as foods rich in proteins, can bring about a relapse.

The treatment is the result of following up the theory of the paper that the disease is a metabolic one, the patient being primarily " deficient "—generally having small bone and being a big milker.

When the disease occurs just before " grass time " care must be taken, as the grass will increase the milk yield and occasionally the trouble is brought on again.

Yours faithfully,

Oscar Stinson.

" Charnwood,"
Appleby,
Westmorland.
March 23rd, 1931.

Gout in Poultry.

To the Editor of The Veterinary Record.

Sir,—I was very much interested in the article on the above subject by Messrs. Craig and Kearney in your issue of March 21st; it is by far the best contribution on the subject that has yet been written.

The matter, I think, eminently lends itself to research, which is likely to prove successful. The authors of the article do not mention the breed of the birds affected: some Continental writers consider that heavy breeds like Cochin Chinas and Brahmas are most liable to the malady, but from my experience at *post-mortems* I have found it in many other breeds. Some experiments as to the best foods to give poultry at different stages of their life and then a plain statement of the facts published abroad would be of benefit to poultry breeders. I feel sure that at the present time many deaths and much disease are due to the thousand and one mixtures that are given to poultry --chick life suffers severe losses from this cause. Meat, fish and blood meals and offals fed to fowls are said to produce gout, but any food that produces acidosis when exercise is limited seems to bring it about.

It is very gratifying to read that Messrs. Craig and Kearney are continuing their research on the part that feeding and management play in the production of this gout.

This malady is said to be rather frequent in birds of prey, and one wonders if it has been encountered in the different Zoological Gardens in the United Kingdom.

In the May issue of the *Veterinary Journal* for 1929 I wrote a short article on " Visceral Gout in Poultry " and in the issues of the *Veterinary Record* for June 18th, July 9th and July 16th, 1927, I had a discussion with Mons. C. Truche on a disease which he called " Mycosis of the Hen," but which, from his description in the issue of the *Veterinary Record* for June 11th, I feel sure was gout: At all events, since that date, " Mycosis of the Hen " has not been resurrected and Heelsbergen, in his latest classic book on Poultry Diseases and Poultry Husbandry, does not mention " Mycosis of the Hen."

Yours truly,

G. Mayall, M.R.C.V.S.

Bolton.

The Editor acknowledges the receipt of the following:—

Communications from Messrs. J. Cane (Wrexham), W. J. Rice (Montrose), A. Spicer (Oxted), Henry Taylor (Haywards Heath) and J. F. D. Tutt (Winchester).

Report of a meeting of the North of Scotland Division, N.V.M.A., from Mr. J. McAllan, Hon. Secretary.

Report of the Annual General Meeting of the North of England Division, N.V.M.A., from Captain J. R. Rider, Hon. Secretary.

Report of the Annual General Meeting of the Eastern Counties Division, N.V.M.A., from Colonel W. A. Wood, Hon. Secretary.

Diseases of Animals Acts, 1894 to 1927.

SUMMARY OF RETURNS.

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic Mange.§		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1 to 15 March, 1931	39	40	2	214	13	23	18	56	10
Corresponding period in—									
1930 ...	23	24	—	—	11	13	17	104	54
1929 ...	19	19	2	449	12	20	28	55	22
1928 ...	31	32	1	92	21	41	10	69	35
Total 1 Jan. to 15 Mar., 1931	120	130	4	469	49	85	132	264	92
Corresponding period in—									
1930 ...	104	109	—	—	85	132	220	529	202
1929 ...	105	118	19	1,701	92	171	256	257	104
1928 ...	130	141	79	7,109	118	266	225	346	158